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Europe Edition January 13, 2014 Volume 169 Number 1

FORTUNE

7 At engineering firm ILC Dover, which is designing a space suit for NASA, 3-D-printed glove molds are custom-made for each astronaut.

PHOTOGRAPH BY CHRISTOPHER LEAMAN

January 13, 2014 Volume 169 Number 1

Leave the page and head to the screen: Get more from *Fortune* on the web and tablet.

WHAT LIES AHEAD FOR 2014?

THE NEW YEAR IS A TIME TO REFLECT AND LOOK AHEAD. ON FORTUNE.COM, WE'LL FEATURE A NUMBER OF STORIES AND SLIDESHOWS ABOUT WHAT OUR WRITERS AND EDITORS THINK WILL HAPPEN IN THE WORLDS OF FINANCE, MANAGEMENT, AND TECH IN THE COMING MONTHS. CHECK OUT NEXT YEAR'S HOUSING OUTLOOK, THE MOST ANTICIPATED VIDEOGAMES, WHICH CEOs WILL BE ON THE HOT SEAT, AND MUCH MORE.

ALL THAT GLITTERS

We asked our Twitter followers and Facebook fans what they would do with the gold bars on our Investor's Guide cover. The answers ranged from practical to bizarre. Some of our favorites:

"@FortuneMagazine Trade into Bitcoin #fortunecover" **(@andysteinmetz)**

"A smart person would hold on to it...maybe even have it broken down into grams. Once the financial market tanks (and it will), we'll go back to the Golden Rule." **(Rafael Holdings via Facebook)**

"I'd sell it before it got any lower and then buy stocks." **(Joseph Jensen via Facebook)**

"@FortuneMagazine I would build a fort using the bars themselves, and I would invite all my friends over for lunch. #FortuneCover" **(@cloudyone)**

"Buy Fortune Magazine..." **(Mahen Nowzadick via Facebook)**

"Take care of my family and make sure that no child goes hungry!!" **(Steven Jacobs via Facebook)**

ILLUSTRATION BY GAVIN POTENZA

January 13, 2014 Volume 169 Number 1

TECHNOLOGY AND ITS DISCONTENTS

AS I'M SURE YOU'VE HEARD, Silicon Valley has been experiencing growing pains. This is true in physical terms: Traffic and congestion are getting worse, and there's all that construction and (gasp) gentrification in San Francisco. But what I'm really talking about is the very audible angst and agita coming out of this part of the world. Let me explain.

Silicon Valley has become the epicenter of the nation's—maybe even the world's—economy. Over a few decades, life-altering products, gigantic companies, whole new industries, and billion-dollar fortunes have been created. That's not just heady stuff; it's unprecedented in the history of the planet. It's only natural that so much success will give rise to pie-eyed pronunciamentos and even boorish behavior by technorati—and, in response, hand-wringing and teeth-gnashing by the itchy tech media corps.

Take, for instance, the high-profile DNA testing company 23andMe, run by Anne Wojcicki (estranged wife of Google founder Sergey Brin), which had apparently ignored FDA concerns. Or two little-known entrepreneurs, Greg Gopman, co-founder of AngelHack, and Peter Shih, a co-founder of Airbrite, who have become infamous for complaining that homeless people are harshing their mellow. Or the union organizer who posed as a Google employee to heckle community activists rallying against tech companies' evil influence in San Francisco (got that one?). Or entrepreneur and Stanford lecturer Balaji Srinivasan, calling for an "opt-in society, outside the U.S., run by technology" (echoing some of the edgier ideas put forth by Peter Thiel, Elon Musk, and Larry Page). And of course there's Marc Benioff, the billionaire Sun King CEO of Salesforce.com, sporting a pair of red, white, blue, *and* sparkly silver Christian Louboutin sneakers at his over-the-top Dreamforce conference, interviewing Haitian Prime Minister Laurent Lamothe about poverty. (Green Day, Blondie, Huey Lewis, Tony Bennett, and Jerry Seinfeld provided the entertainment.) Talk about looking at the world through Google glass(es)!

Clearly some of this is hubristic, some of it's bombastic, some of it is just plain stupid—and some of it even makes a little sense. The point is that none of it is really surprising. You can't have this much change in this short a time without contracting some major cases of ironic discomfort. The thing is, you can say whatever you want when you're a 25-year-old geek in a garage, but when you're running a company worth billions and President Obama wants to drop by, the world pays attention.

Silicon Valley has always been about challenging the status quo. Historically that was restricted to the world of business, but now it's turning to health care, foreign policy, and regulation. I say that's a good thing. Just realize that gaffes can and will ensue. It's the price of large-scale change.

Change—as in disruption, as in opportunity—is the theme of the magazine in your hands, our third annual Future issue. In it you'll find where the smart money is placing bets, and what life-changing (and life-saving) products are in the works. You may also notice a change in the experience of reading it: Our design team, led by creative director Brandon Kavulla, has refreshed the magazine with a modern look influenced by the graphic language of currency and by the Art Deco elegance of *Fortune*'s earliest issues. The typographer (and TED speaker) Marian Batnjes drew a custom alphabet that you'll see in much of the display type. I trust that you'll find it all change for the better.

Andy Serwer

ANDY SERWER
Managing Editor

PHOTOGRAPH BY RICHARD PHIBBS

Closer Look

At Enfield Cotton Gin in North Carolina, an employee lifts a 525-pound cotton bale with a forklift before it travels up American Giant's supply chain.

MACRO

Homemade Cotton Cloth

Apparel company American Giant makes the hottest sweatshirt on the market. Demand brought an unexpected move: to source and manufacture it all in the U.S.

BY CRAIG GIAMMONA
PHOTOGRAPH BY **MIKE BELLEME**

FOR THE PAST YEAR the San Francisco–based apparel company American Giant has had a very nice problem indeed: Soaring demand for its signature hoodie made it very difficult for the company to keep the item in stock. Last December, when a web story about American Giant appeared under the headline THIS IS THE GREATEST HOODIE EVER MADE, it did \$500,000 in sales over the following 24 hours. By the end of the week the company was sold out. It spent the next nine months ramping up production. CEO Bayard Winthrop, a 44-year-old former investment banker, says his three-year-old company had boosted production capacity 20-fold over the past year by adding sewing lines at three factories in North Carolina and another in Los Angeles—with one unexpected twist: Months earlier it had moved Giant's fabric sourcing back to America too. ¶ Winthrop, having launched American Giant in 2011 with an initial \$300,000 investment from former Pepsi CEO Donald Kendall, says the company

is not yet profitable. Still, sales have continued to grow this year despite the difficulty of keeping items in stock. Winthrop says he is finding it easier to manage supply logistics now that he's sourcing fabric domestically. After solvents caused blotting on T-shirts at the Los Angeles factory recently, he was able to get his production chief in California on the phone with his fabric supplier in South Carolina. The issue was fixed in a few hours, and only about 10 yards of fabric went to waste. Had the company still been sourcing fabric from India, Winthrop says, the same issue could have taken weeks to resolve, and thousands of yards of fabric could have been lost. "This wasn't a myopic quest to make everything in America," he says. "You just can't get that kind of quality control" with overseas suppliers.

Labor costs in the U.S. are more than double what they are in, say, India, but American Giant makes up for its relatively high worker wages with a direct-to-consumer marketing strategy. Rather than slicing costs and sacrificing quality, American Giant uses the Internet to cut out wholesalers and avoid the markups that come with getting on retailers' shelves. The company estimates it saves about 75¢ a yard on fabric by being in the States.

"It's stunning how many people say they want to 'buy U.S.,' but they can't find it," says Augustine Tantillo, president of the National Council of Textile Organizations. The goal for 2014, Winthrop says, is "to see what happens when we're fully stocked."

INTERNATIONAL

China Goes (Baby) Boom!

After relaxing its one-child policy, the nation braces for a wave of infants. Will it last? **BY SCOTT CENDROWSKI**

ON A RECENT SATURDAY Larry Kung, co-founder of Leyou, a Chinese baby-product retailer, made a surprise visit to his store in Beijing's newest mall, Aegean. Kung has spent the past two weeks estimating the number of babies China can expect now that the government has announced it is relaxing its one-child policy. As best as Kung can tell, China should deliver at least 1 million more babies a year total. The boom for Kung begins here in the maternity section. He gestured toward a line of anti-radiation maternity clothing.

Inside the dresses' material is a blended silver weave that supposedly prevents electromagnetic radiation from entering the womb; it is one of the most popular maternity products and costs $100. Kung asked a saleswoman about a surge in buyers. Not yet, she said, but the item usually sells after a couple of months of pregnancy. She and her colleagues have been asking shoppers with a child whether they're planning to have a second. She proudly told her boss, "They say they are considering!"

When China's state-mandated family planning began, in 1979, it was an effort to control the swelling population of a poor nation. But one-child worked too well, wreaking a gender imbalance (about 117 boys for every 100 girls) and an elderly population proportion that rivals Japan's. Lu Ting, a China economist at Bank of America Merrill Lynch, expects pent-up demand for second children to yield 9.5 million additional babies over the next five years, but the trend won't stick. As China gets richer, it will probably follow the example of South Korea, where family planning ruled for more than 25 years but childbirth stayed on a downward trend after the policy ended in 1996. It's the same picture in Hong Kong, Singapore, Thailand, and Malaysia—citizens of wealthier countries simply have fewer kids.

There is an upside: "You get more and more resources pushed into children and education, and productivity will go up enormously as a result," says Ted Fishman, author of *China, Inc.* "So China remains competitive no matter which scenario plays out." As Fishman notes, there are more Chinese under 14 than there are people in the U.S. And China's labor issues cannot be fixed by more kids anyway—its workers want to be paid more, which is all but inevitable as the society becomes wealthier, transitions to a service economy, and strives to compete globally with intellectual capital.

Back in the Aegean mall, Kung finished rearranging a display of Snoopy sweaters before he spotted a young couple. The woman rubbed her belly as they eyed his anti-radiation blouses.

PREVIOUS PAGES: COURTESY OF AMERICAN GIANT

ILLUSTRATION BY **SÉBASTIEN THIBAULT**

The Space Suit Gets Upgraded

A company that first made outfits for the lunar landing redesigns its gear. BY CATHERINE DUNN

At ILC Dover, which made the first space suits for walking on the Moon, a lab manager tests new components on a suit used aboard the International Space Station.

For five decades ILC Dover, an engineering firm in Delaware farm country, has been outfitting astronauts for space—everyone from Neil Armstrong to Sunita Williams, who performed a space walk outside the International Space Station (ISS) in 2012. And yet ILC (which was founded as International Latex Corp.) has never before embarked on its latest mission: to make a fashion-forward suit for NASA.

The prototype is called Z-2. A new palette will be chosen when, early this year, NASA unveils three designs by Philadelphia University fashion and industrial design students. The public gets to pick a winner. Each design will draw on one of three themes: NASA's history, sports and superheroes, and nature. NASA officials hope that the campaign will rekindle excitement for the space program. "Part of this came from the fact that commercial space flight is gearing up," says Amy Ross, a top space-suit engineer at NASA, "and part of what they want is for their space suits to look cool."

Such is Z-2's colorful fate, arriving at a crossroads in above-atmosphere travel. The capabilities of the $4.3 million prototype, slated for delivery in late 2014, will be so advanced that Ross expects it to become a landmark—a steppingstone en route to Mars or a return Moon trip. Still, no manned Martian mission exists, and ever since the space shuttle program ended in 2011, U.S. astronauts have had to catch a ride to the ISS on Russian spacecraft.

ILC has had to reorient its space-products business (about 20% of its total revenue) accordingly: "If we're going to provide space suits to customers, we're going to need more customers than NASA," says Phil Spampinato, the program manager of space products. ILC is working with Boeing on impact bags for the airplane maker's bid to carry U.S. crews to the space station for NASA. And Boeing has also shown interest in the balloon-like landing gear that ILC designed for Mars rovers. The company's products might also appeal to Orbital Sciences, which has launched unmanned cargo missions of its own.

Founded in 1937, ILC has adapted before. Its latex dipping and fabricating prowess from the company's Playtex brand of women's undergarments helped ILC win the Apollo contract to make pressurized suits (Warner Bros. is developing a film about its creation).

Today the privately held company no longer manufactures girdles and brassieres (Playtex became a separate entity in 1967)—it specializes in products that protect against the harshest environments, including gas masks, aerostats, and a giant inflatable tunnel plug to stop floodwaters, developed for the Department of Homeland Security. Fifty percent of the company's business is containment products for pharmaceutical and biopharma companies. But the space suit is the calling card, and a reimagined version will be a giant leap. ■

PHOTOGRAPH BY CHRISTOPHER LEAMAN

Hollywood's Military Complex

THE EXTRAORDINARY SAVINGS BEHIND A BLOCKBUSTER PARTNERSHIP. *By Soo Youn*

In 2009, Somali pirates hijacked the cargo ship *Maersk Alabama* and took its captain, Richard Phillips, hostage in a lifeboat. Within days the U.S. military stormed in, equipped with a guided-missile destroyer, a Wasp amphibious-assault ship, an Oliver Hazard Perry–class frigate, several helicopters, and members of Seal Team Six. In the movie version, Tom Hanks plays Captain Phillips, while a similar missile destroyer, the Wasp, the helicopters, and the Seals play themselves (though they are not on active duty)—courtesy of the U.S. Navy.

Even in an age of special effects, it's exponentially cheaper to film on actual military ships with real military advisers. Despite action sequences and an A-list lead, *Captain Phillips* cost about $55 million to make (compared with a visual-effects fest like *Gravity*, which cost about $100 million). The fulcrum of Hollywood's unlikely partnership is Phil Strub, a former film school student and Navy videographer, now the entertainment liaison at the Department of Defense.

Scripts of movies helmed by Michael Bay, Ridley Scott, and Steven Spielberg are regularly sent to Strub's ascetic office at the Pentagon in hopes of procuring military cooperation. If he signs off, the filmmakers gain access to the most awesome arsenal in the world, and in turn, the image and message of the American armed forces get projected before a global audience.

Captain Russell Coons, Strub's colleague in the Navy, says that they participated in *Captain Phillips* because it was "an opportunity to highlight our capabilities and showcase Navy's antipiracy and maritime-security operations." The script required no changes for their approval, Strub says. But some do.

Take last summer's *Superman* reboot, *Man of Steel*: Strub found the script's portrayal of the military "cartoony." Warner Bros. asked him to reconsider, flying him to L.A. to meet screenwriter David S. Goyer, who modified his script to incorporate Strub's suggestions. After the changes and Strub's green light, production set up at Edwards Air Force Base in California, home of the original *Right Stuff* test pilots. The Army pitched in with three helicopters and six Humvees.

The producers weren't charged to use the equipment, which was essentially idled during filming, but they paid for its transport to Edwards. And by using active-duty military personnel who are currently training, filmmakers were also able to skirt the Screen Actors Guild daily minimum rates for unionized actors. All told, the military machines cost less than $1 million in a movie with a $200 million budget.

Those cost savings can be crucial for getting a movie made at all. "You couldn't make *Battleship* without the help of the military," says producer Duncan Henderson. "To take any one of these ships out to sea, the fuel costs alone would be astronomical."

Films supported by the military (clockwise from top left): *Captain Phillips, Man of Steel, Flags of Our Fathers, I Am Legend*

CLOCKWISE FROM TOP RIGHT: ASIN ROLAND—COLUMBIA PICTURES/COURTESY EVERETT COLLECTION; CLAY ENOS—WARNER BROS. PICTURES/COURTESY EVERETT COLLECTION; WARNER BROS./COURTESY EVERETT COLLECTION; DREAMWORKS/COURTESY EVERETT COLLECTION

Read more on this subject on Fortune.com and our app.

Airline Hubs in the Middle East, Arise

A decade ago Dubai's international airport would have been far smaller on this map—it was the 27th-largest hub for international travelers. Today nearly 60 million passengers move through a year, and a $7.8 billion expansion will see its capacity swell to 90 million by 2018. It will be the largest most-trafficked international hub in the world. Dubai's neighbor Abu Dhabi is building a $3 billion terminal, and Doha, in Qatar, is sinking $15.5 billion into its international airport. All told, the region has seen a 13 [illegible] rise in international passengers since 2002; North America rose just 1.3%

GRAPHIC: NICOLAS RAPP
FLIGHT PATHS BY JOHN O
AIRPORT DATA AND RANKING BY ACI WORLD


CONGRATULATIONS
YOU ARE NOW AT
WIDEN YOUR WORLD
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LIONEL MESSI
FROM
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TO
KILIMANJARO
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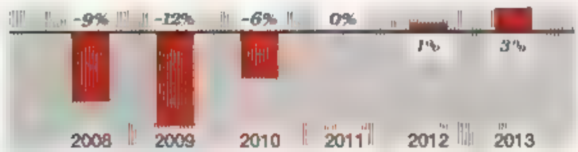
VENTURE

HIRING AGAIN
Net employment change reported by small business



LaMagna photographed at IceStone's Brooklyn factory

How I Got Started

The Rise of the Tweezerman

Inspired by an unlikely episode, Dal LaMagna built his company from the bottom up. ***Interview by Dinah Eng***

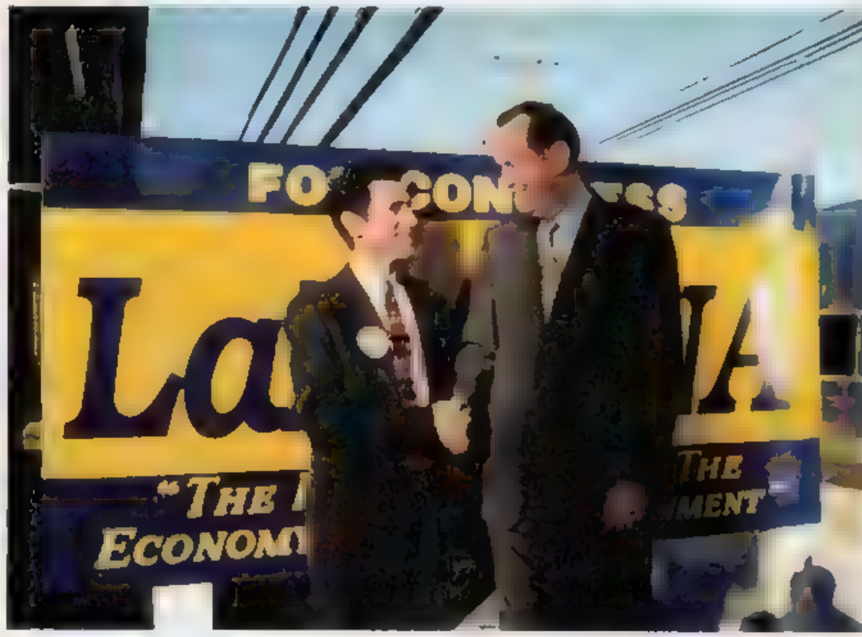
NOBODY EVER ACCUSED *Dal LaMagna of thinking small. As a child he wanted to be both Pope—and a millionaire. After numerous failed ventures, LaMagna (rhymes with "lasagna") got a splinter of an idea*

GRAPHIC SOURCE: NFIB. OCTOBER DATA REFLECTS TRAILING THREE MONTHS

PHOTOGRAPH BY MARTIN ADOLFSSON

"I sold Dal LaMagna Grooming tweezers until I walked into a beauty salon and someone yelled, 'Tweezerman is here!' I immediately changed the name to Tweezerman." *—Dal LaMagna*

that he built into Tweezerman, a maker of beauty tools with $50 million in annual revenues. (It's now owned by Zwilling J.A. Henckels.) LaMagna, 67, remains engaged in policy (he ran unsuccessfully for Congress) and commerce: He's now the CEO of IceStone, which makes countertops out of recycled glass and cement.



LaMagna campaigning for Congress in 1996 with then-Sen. Bill Bradley

I grew up in Queens, N.Y., in a family of five kids and went to Catholic schools. My father was a fireman and longshoreman, working two or three jobs to support us. Every year the elementary school would raffle off a donated Cadillac to raise funds. The prize for most chances sold was a Schwinn Racer. My parents couldn't afford to buy me a bicycle, so in third grade, I sold 48 books [of raffle tickets] to get the bike, and won it. That was the start of my career.

I didn't ever want to be a guy who'd go to work and get paid by the hour. I wanted to make a difference in the world, and I thought being a millionaire would allow me to do that. So I applied to the business schools at Harvard, Columbia, and Stanford universities and got accepted by Harvard and Columbia. My background was more in the direction of the Willy Loman school of business than an Ivy League citadel, so going to Harvard really expanded my view of things.

During my undergrad and MBA years I started more than a dozen businesses, each of which imploded. I converted drive-in movie theaters to drive-in discotheques, but it rained 11 times in a row, and the business failed. I opened a waterbed store in Harvard Square, but the landlady evicted us because she was afraid the beds would leak. When I graduated from Harvard in 1971, I wanted to be a movie producer to influence opinions in society. So I spent 10 years trying to put together a film project and ended up in Venice Beach, Calif.

It was 1979, and I was running an ice cream parlor there. One day I was sunbathing *au naturel* with two women who were sisters on the rooftop of their apartment building next door when one sister's boyfriend showed up. Next thing I know, he was with her, and I ended up with the other sister on the redwood deck. When I went home, I had splinters all over my butt. Redwood doesn't dissolve; it infects. So I went to a drugstore and asked for needle-pointed tweezers, but couldn't find any. That gave me the idea to sell splinter tweezers.

At that point I had bounced from one business to another, and by age 32, I was $150,000 in debt and had failed at everything I'd tried. So I moved back to New York and got a minimum-wage job working for an electronics company. I saw people on the assembly line picking up diodes with needle-point tweezers. There was my product idea! So I decided to market electronic industrial tweezers as splinter tweezers to hardware stores and lumberyards.

I started with $500, and my father, who had retired as a longshoreman, decided to invest in the idea. Over the next few years my dad lent me $180,000, and I paid him 12% interest on it. My dad also played the lottery, hoping to make $1 million one day. At some point I converted half of the $180,000 he'd lent me to stock. When I sold the company, his stock was worth $1 million, which made me really happy.

Back then I found about 20 manufacturers of tweezers in Europe. I decided on Dumont in Switzerland, which made tweezers for doctors, and persuaded them to sell to me.

Packaging was expensive, so I went to the guys who made the package molds and got 100 blister packs for free, hand-glued the blisters onto cards, and went to the lumberyards.

"Don't fear failure. Fear success—because when you succeed, you're going to be living your dream 24 hours a day. So make sure it's what you really want." —*Dal LaMagna*

The tweezers sold for $10, and people bought them. But it wasn't something I could make a living with. My brother's ex-girlfriend worked in a beauty salon and said, "If you can get me tweezers that are not pointed and not so sharp, I could sell them to my customers."

So I found some diamond tweezers, put them in standard-size tubes, and on Saturdays went around to beauty salons on Long Island. I'd sell $150 worth a day, and at that point I had a successful business. There was no overhead. The tweezers cost $4, and they sold for $10, so there was always a profit.

The first year, the company made $80,000. The second year, we made $180,000; the third year, $350,000. After that the annual revenue steadily grew 20% a year.

In 1982, I was selling my Precision Eyebrow Tweezers in tubes to cosmetologists and thought I should put my name on them and become a grooming company. So I sold Dal LaMagna Grooming tweezers for a while, until I walked into a beauty salon and someone yelled, "Tweezerman is here!" I immediately changed the name to Tweezerman and started to hire sales representatives. By 1984, Tweezerman was grossing nearly $1 million annually, and would surpass that million-dollar mark the next year. But we still had problems with cash flow.

Back then credit card companies would send us credit cards, and I took every credit card I got. At the peak I had 45 cards. I'd use the cash advance to meet payroll and pay the bills. I ended up with $180,000 in credit card debt, and the interest rate was 12% to 16%. Around 1986, I went to Chase Manhattan Bank, and they lent me $180,000 to pay off the credit cards. Why did they give me that loan? There were times I'd make $80,000 to $90,000 on a weekend from a trade show, and I always deposited it in the bank. I never kept the cash and never lied about anything. So the banker said, "You're competent, and you're honest. Most people would have pocketed that cash."

My Advice

DAL LAMAGNA
Founder, Tweezerman, and CEO, IceStone

DON'T FEAR FAILURE. Fear success—because when you succeed, you're going to be living your dream 24 hours a day. So make sure it's what you really want.

EMPOWER EMPLOYEES. I created an employee stock-ownership plan. After Hurricane Sandy flooded every piece of equipment at IceStone, employees took it upon themselves to repair everything instead of replacing it. We saved $4 million.

INVEST IN WHAT MATTERS TO EMPLOYEES. I told folks, "Anything you can find that the company doesn't need, I'll put that savings toward health care." People gave up their company-owned cellphones, and now people who make more pay proportionately more for health care, which ranges from $40 a month for the factory workers to $140 a month for managers, and everyone has coverage.

I sold similar tweezers, packaged differently, to different distribution channels. There was Tweezerman Professional for Sally Beauty Supply, Spa Tweezerman for Bed, Bath & Beyond and the department stores, and Tweezerman Limited for the chain drugstores, like Walgreens and CVS.

The challenge for me was to be patient. I had to discipline myself to sell just tweezers before I expanded to other beauty tools. As the years passed, we made a cuticle nipper, eyelash comb, haircutting scissors—any grooming tool you can think of. We ended up with about 200 SKUs. No one could deliver the quality at the prices I was delivering it.

In 2004 we were doing $32 million in sales. I was against the war in Iraq, funding antiwar movies, and was a political activist. I had no interest in being Tweezerman for the rest of my life. I started approaching people who might be interested in buying us, with four conditions: They couldn't lay anyone off; they couldn't move the company, which would cause people to lose their jobs; they had to continue our practice of responsible capitalism, which meant things like paying people a living wage; and the purchase price had to be at least $40 million.

Zwilling J.A. Henckels agreed and offered $57 million. So I sold the company to them, and stayed on Tweezerman's board until 2013. Now I'm no longer involved in the company.

When I sold Tweezerman, I started to invest in businesses that would have an impact in the world. I gave $50,000 to IceStone, a company that makes countertops out of recycled glass and cement, which are both green and beautiful. Over the last few years I put more money in, and I am now IceStone's president, CEO, and COO. I've gone from being a guy who wanted to turn the company around and sell it to being the guy who wants to turn IceStone into a green building-products company and build it, like I did with Tweezerman.

It took a lot of failures to get to success. I think anyone can be a millionaire if you set your mind to it. It takes focus, perseverance, and collaboration. You get more from collaborating with people than competing with them. If you're only in business to make money, you'll lead a very hollow life.

The Accidental Auctioneer

KATHLEEN DOYLE IS MAKING A BID TO TURN HER FAMILY'S BUSINESS INTO A GLOBAL PLAYER. *By Dinah Eng*

Doyle has modernized her family's New York City antiques business

Kathleen Doyle never planned on running an auction house. But when her husband, William J. Doyle, founder and CEO of auctioneer and art-appraisal company Doyle New York, died of leukemia 20 years ago at age 53, she not only stabilized the firm but modernized a business that was antiquated in more ways than one—and turned the company into a global brand.

"It was a shock when my husband died in 1993, and I took over the business," says Doyle, who had worked at the company in its early years (it started as an antiques store in 1962) before pursuing a master's degree in child development.

Doyle, 69, is modest about her stewardship of the company ("We had a senior team in place that's still here," she demurs), but examples of widows or widowers successfully succeeding their spouses as CEOs are rare, with notable exceptions like Katharine Graham, who took the reins of the Washington Post after her husband, Philip, committed suicide in 1963. (The Post was her family's business.)

Despite her grief, Kathleen Doyle wasted little time putting her mark on the auction house her husband built. Under her leadership, Doyle became the first New York auction house to initiate live Internet bidding, holding auctions online with Amazon and others in 1999. It later became the first of its competitors to put its illustrated catalogue online.

Doyle continues to democratize the elite world of auctions. Her appraisers regularly appear on the popular public television program *Antiques Roadshow*, and the company periodically conducts seminars about fine art. "No one's figured out how to maintain prestige on a mass basis," says Oliver Chen, an equity analyst at Citigroup. "If you can do that and focus on being hip and relevant, there's a big opportunity for a smaller house like Doyle."

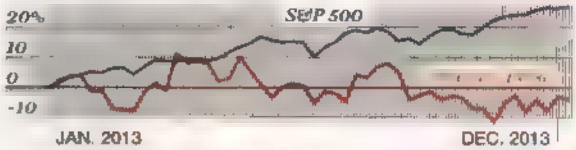
Indeed, Doyle successfully competes with giants Christie's and Sotheby's in estate auctions. "Their approach is very personal," says Liana Paredes, director of collections and the chief curator at Hillwood Estate, Museum & Gardens, a museum housed in the former home of Marjorie Merriweather Post. In February, Doyle auctioned items from the collections of the Post family, winning the business over two unnamed rivals.

Doyle declines to disclose revenue for the family enterprise, which does not have any outside investors, but says her goal is to make Doyle New York a $1-billion-in-revenue company. She's also grooming a daughter, Laura, who now heads the regional representatives offices, to run the business one day. "She's capable of taking over the reins at any moment," Doyle says. Such succession planning ensures that for at least another generation there will be a Doyle at Doyle New York.

PHOTOGRAPH BY MACKENZIE STROH

INVEST

A SLUGGISH 2013
High hopes for the Mexican stock market were dashed, as it was far outpaced by the S&P 500



Emerging Markets

Why 2014 Could Be Mexico's Year

Experts have proclaimed the country the next big thing before. This time may be different. ***By Jen Wieczner***

LAST YEAR AT THIS TIME investors were rushing into Mexico. A new President with an ambitious reform to-do list had just taken office. And the largest IPO in Mexican history, the $4 billion offering of Spanish bank Santander's Mexican division,

GRAPHIC: STOCK & CAPITAL IQ

ILLUSTRATION BY OLIVER MUNDAY

"We find Mexico in a relatively sweet spot and in stark contrast to the majority of emerging markets."
—Paulina Amieva, T. Rowe Price

had just taken place. To listen to the government, 2013 would elevate Mexico to an economic powerhouse. But the new administration pinched pennies and GDP growth slowed to just 1%, a fraction of 2013 expectations. By December, stocks were down 4% and many investors seemed to give up hope. "They felt Mexico's moment was slipping," says David M. Darst, chief investment strategist for Morgan Stanley Wealth Management, who spent much of the past two years on the ground in Mexico studying the country's prospects.

Now many are singing the same refrain they sang last year: 2014 will be the market fiesta that 2013 wasn't. Those who bet on Mexico last year are rightfully wary of being fooled again, but there's a good case to be made that 2013's optimism wasn't wrong, just premature. Recent legislative reforms of the nation's tax and education systems—as well as telecom and energy infrastructures (more on those in a bit)—are beginning to give Mexico's sprawling middle class a boost. That, says legendary investor Mark Mobius, executive chairman of Templeton Emerging Markets Group, is fueling "explosive growth in demand" for consumer products. And Mobius isn't one to mince words: "We see a great future for Mexico and want to be part of that future," he tells *Fortune*.

Indeed, on many fronts the investment picture in Mexico looks brighter than it did a year ago. Among the world's emerging markets, Mexico stands to benefit the most from growth in the U.S., its biggest customer by far. It also has the least to lose from the expected "tapering" by the U.S. Federal Reserve, because Mexico has a smaller trade deficit than most of its peer countries. "The reforms are sort of the cherry on top that could make Mexico really exciting over the next five years," says Lewis Kaufman, who manages the $1.7 billion Thornburg Developing World Fund, which gained about 13% in total return through mid-December 2013 while its benchmark sank 4%.

A couple of weeks before Christmas, Mexico's Congress approved a watershed constitutional amendment that could open up the country's state-controlled oil reserves to private companies. The energy reform will require further legislation in 2014. But the progress already exceeds investors' highest hopes, and it has reinvigorated belief that Mexico is on the cusp of a radical transformation. Oil reform "was always the capstone; this was the apex," says Darst, whose top pick, Mexico's largest petrochemical producer, **Alpek**, should benefit from the policy change.

Rick Hoss, manager of the EP Latin America Fund, likes companies that will prosper in a post-reform Mexico, such as **Infraestructura Energética Nova**, a natural-gas-pipeline company that went public in 2013, and **Alsea**, which operates Mexican Starbucks stores. Hoss, whose fund ranked first in its Morningstar category in 2013, now has 56% of his $20 million portfolio in Mexico—double the index benchmark—after a trip south of the border last June. (When the fund launched in 2011, it tipped 80% to Brazil.)

As with any emerging-markets investing strategy, a broad index approach can be the best and safest over the long term. But in the case of Mexico, that's a challenge: The index-tracking ETFs are weighed down by the country's traditional blue chips, whose future is less certain in an era of antitrust reform. América Móvil and Televisa, for example—major targets of Mexico's pro-competition telecom reform—alone constitute nearly 25% of the iShares MSCI Mexico Capped ETF. There's also the question of valuation. Share prices of the relatively few companies listed on Mexico's only stock exchange, the Bolsa Mexicana de Valores, peaked at an average of 20 times earnings in November—higher than the P/E of even the S&P 500.

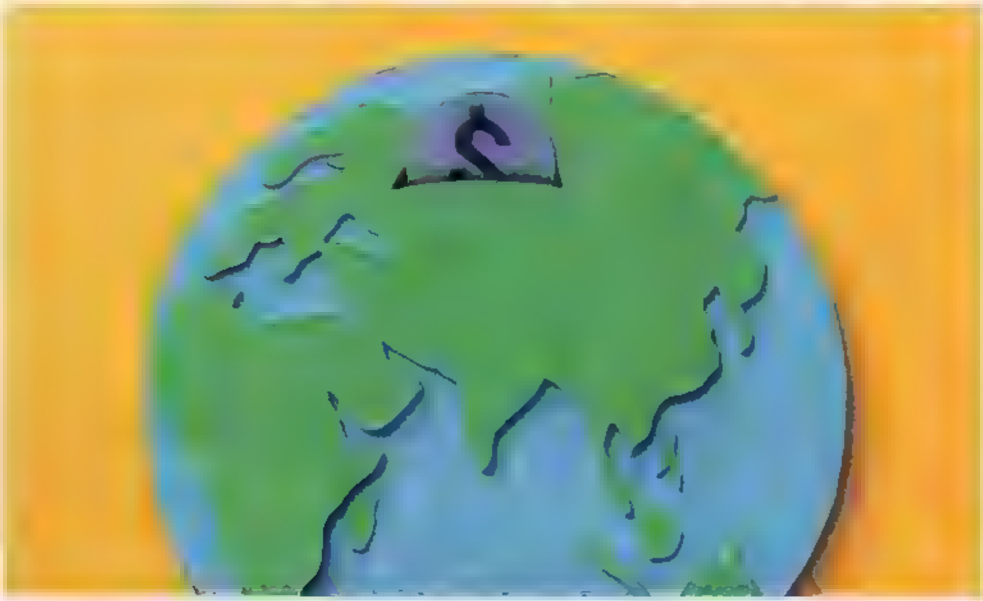
Still, an investing window appears to have opened up, experts say. Valuations based on future earnings estimates (with P/E multiples averaging 17.5) look cheaper today than they did about six months ago. "There is already evidence that the economy has bottomed," says T. Rowe Price equity analyst (and Mexico native) Paulina Amieva. "For us as investors, we find Mexico in a relatively sweet spot and in stark contrast to the majority of emerging markets."

A few investors have found Mexico market plays north of the border. Thornburg's Kaufman, for example, favors U.S.-based **First Cash Financial Services**, which gets the majority of its revenue from pawnshops in Mexico. American oil companies like **Halliburton** and **Schlumberger** may also benefit from Mexican energy reform, says Morgan Stanley's Darst.

And as U.S. growth trickles down into Mexico, spurring the housing market there, Darst—who calls Mexico the "Asia next door"—expects homebuilders like **Cemex** and real estate offerings such as **Macquarie Mexican REIT** to thrive. Says Juan Carlos Pérez Macías, head of S&P Capital IQ's new Mexico City office, which opened in September to cater to the burgeoning investor market there: "This is the Mexican moment—the next years will be a fantastic opportunity." The next few months may bear that out. ■

NEED BONDS? LOOK FAR AFIELD

FIXED INCOME IN EMERGING MARKETS OFFERS DIVERSIFICATION AND, THANKS TO A PLUNGE IN PRICES, GENEROUS YIELDS. *By Janice Revell*



The past half-year has been a dismal period for emerging-market bond investors. The pain began in May, when the Federal Reserve signaled that it may soon taper its massive bond-buying program. As prices for U.S. bonds dropped and yields shot up, money simultaneously flooded out of emerging-market bonds. For 2013 the total return (including interest payouts) for mutual funds specializing in emerging-market bonds was –6.9% as of mid-December, much harsher than the –1.4% return for the Barclays U.S. Aggregate Bond Index. But the selloff, say many experts, has now gone too far—leaving investors with some compelling reasons to add emerging-market bonds to their fixed-income portfolios.

To begin with, the yields suddenly look extremely attractive. Thanks to the recent plunge in prices, the average yield on emerging-market government bonds is close to 6%. That's about the same as the average yield on much riskier U.S. corporate junk-rated bonds, even though the majority of emerging-market government issuers carry investment-grade credit ratings. Meanwhile, the difference between the yield on emerging-market bonds and U.S. Treasury bonds with comparable maturities now stands at around 3.5 percentage points, well above the average three-point spread in the five years leading up to the financial crisis. "Emerging-market bonds are great values at the current spread," says Jason Hsu, chief investment officer of Research Affiliates. Hsu also points out that returns for emerging-market bonds have historically displayed a low correlation with U.S. bonds over most of the past two decades, providing investors with valuable diversification.

The easiest way to gain exposure to emerging-market bonds is through a mutual fund or an ETF. Currency movements can cause emerging-market bond returns to swing dramatically. If an emerging economy's currency drops in value against the dollar, investors can lose money even when the bond's price increases. To minimize that risk, opt for a fund specifically designed to neutralize the currency impact. One such fund is **Pimco Emerging Markets Bond,** a top pick of Morningstar analyst Michelle Canavan Ward, which currently invests about two-thirds of its assets in the investment-grade-rated debt of Brazil, Mexico, and Russia. Another good choice is **Fidelity New Markets Income,** which boosts its returns by taking small stakes in riskier sovereign bonds, such as those issued by Romania and Slovenia. A third, **T. Rowe Price Emerging Markets Bond,** holds about one-quarter of its assets in emerging-markets corporate bonds. Over the past decade all three funds have produced above-average returns relative to their peers, while charging below-average fees.

Advisers generally recommend that investors allocate up to 20% of their overall bond holdings to emerging markets. The diversification benefits, combined with today's attractive yields, can make the foreign venture worth your while. F

A former compensation consultant, Janice Revell has been writing about personal finance since 2000.

PORTRAIT BY JOHN W. KERN

ILLUSTRATION BY DAVID SCHWEN

Rebuilt Stock, Drives Like New?

PRIVATE EQUITY FIRMS ARE ROLLING OUT IPOs OF THEIR OVERHAULED PORTFOLIO COMPANIES AT A RECORD RATE. YOU SHOULD THINK TWICE BEFORE BUYING. *By Lauren Silva Laughlin*

For private equity firms, 2013 has been a year of exits. With the stock markets roaring, they've been peddling their portfolio companies to retail investors almost daily. Some 170 companies have gone public this year after a period of private equity (PE) ownership, including big names such as Hilton and SeaWorld. The $30 billion in post-PE IPOs in the U.S. established a new record. (Non-U.S. markets have seen another $21 billion.)

The stocks look shiny and new, but you should hesitate before you drive one of them off the lot. Private equity managers have a simple method: They buy companies, overhaul them, then resell them for a profit. The firms replace management teams and ratchet down costs, and that can accelerate profits. That's great—but the firms also borrow heavily to buy these companies and typically load them with a speed-inhibiting 20% more debt than their peers, according to S&P Capital IQ LCD. In addition, private equity managers make oodles—Blackstone, for example, has an unrealized $8.5 billion gain on its Hilton stake based on the IPO price—making one wonder whether the stock has maxed out before it lists shares.

At first glance post-PE IPOs have performed superbly, according to a report by Harvard investment-banking professor Josh Lerner that examined their track record in the two decades through 2002. Though out of date, the research covers several cycles, so it's still telling. It found the average return to be a stellar 44% in the three years after the company went public, vs. 28% for the S&P 500.

But it turns out that a handful of stock Ferraris skewed the numbers: The *median return* in the study was a meager 2.7%. That suggests that picking a winning post-PE IPO is tricky.

Newer data reinforce the point. Since April 2009 private-equity-backed IPOs are up an average 53%, measured from their first day of trading through Dec. 5, 2013, according to EY (formerly Ernst & Young). When matched for weights and holding periods, the S&P gained 34%. But only about half of the IPOs beat the S&P and nearly a third gained less than 10%.

Moreover, all the figures are partly inflated because of the IPO "pop," the jump IPOs often take on their first day. That accounts for 14 percentage points of the return in PE-backed IPOs over the past decade, according to Dealogic, and regular investors are rarely able to obtain shares until after the pop has occurred.

One alternative for investors: **First Trust U.S. IPO Index Fund.** It buys all sorts of IPO stocks—not just post-PE ones—resulting in a portfolio every bit as eclectic as recent IPOs: everything from Facebook to GM, from Tesla to Dollar General. Over the past five years it has returned an average annual 27.3%, compared with 17.9% for the S&P. It increases the average person's chance of getting a piece of the next IPO racer.

ILLUSTRATION BY WESLEY ALLSBROOK

The Volcker Rule: A Triumph of Complexity Over Common Sense

By Allan Sloan

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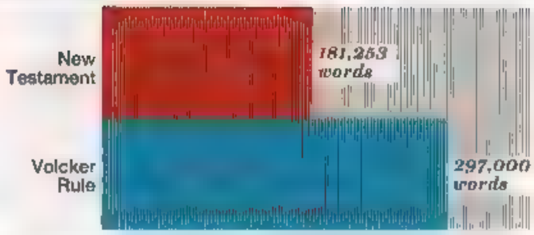


RED TAPE ALERT The Volcker Rule is half again as long as the Greek version of the New Testament

GREAT SOUND BITES often make for bad policy, because things that seem wonderful and simple in the abstract frequently turn out to be hideously complicated when you try to apply them in real life. That's my takeaway from the Volcker Rule, which was unveiled in mid-December after five different federal financial regulatory agencies—another example of real-world complexity—finally signed off on it.

The rule has 71 pages, which is a lot of words to transform former Fed chairman Paul Volcker's simple-sounding proposal into law. His idea, as you probably know, was to ban big financial institutions from putting taxpayers at risk by using federally insured deposits for securities speculation. But the rule itself is only the start of the complexity. It comes with an 892-page explanation. Combine the two parts and you have an opus half again as long as the New Testament, and one that to regular people might as well be written in the original Greek.

In the real world, the longer and more complicated something is, the more difficult it is to enforce and the more opportunities there are to game it. When you've got 297,000 words of text (by the count of the Davis Polk & Wardwell law firm), you've got loads of lurking loopholes.

Ever since Volcker first enunciated his idea in early 2009, I've been skeptical of it because he didn't propose to stop banks from making markets in securities on behalf of their customers. Market making requires buying and selling securities, and keeping some on hand as inventory. Differentiating between these trades and trades made for a bank's own account is devilishly difficult, if not outright impossible. Even with almost 1,000 pages of rules and explanations, it's going to be up to regulators to decide in specific cases what's speculating and what's perfectly permissible market making.

Throw in the fact that banks will be allowed to trade in order to hedge exposures to various things, and you've got complexity squared. Heck, complexity cubed. Or to the fourth power.

The solution to the problem that the Volcker Rule tries to address is what I call the Hoenig Rule: a 2011 proposal by Tom Hoenig, then head of the Kansas City Fed and currently vice chair of the Federal Deposit Insurance Corp., to ban banks from all trading. However, unlike Volcker, who was an adviser to President Obama and is treated by many people (not including me) as a quasi-divine being, Hoenig's name carries little clout in Washington.

In a statement, Hoenig said that while he supported the Volcker Rule, it nevertheless allows big financial institutions to "continue to engage in market making and related trading activities, which as we have learned from recent experience can be too easily gamed. All such activities should be conducted away from the safety net, in firms that do not engage in commercial banking." I totally agree. The Hoenig Rule would need some tweaking, but it starts out way superior to Volcker.

By the way, don't put too much faith in the fact that chief executives of Volcker Rule institutions will be required to personally certify that the rule is being observed. The Sarbanes-Oxley Act, enacted in 2002 after the Enron and WorldCom accounting scandals, required similar sign-offs and was supposed to eliminate earnings restatements. However, there are still plenty of those.

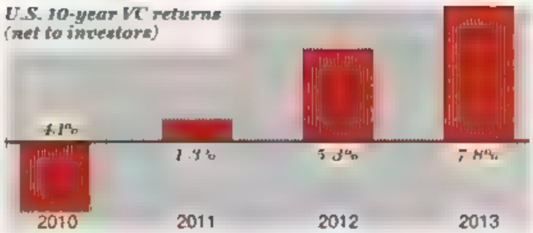
The Volcker Rule is better than nothing, but it's just not worth the effort and expense expended on it or the problems it has caused and will cause. Ditto for "living wills," which supposedly will let regulators liquidate huge, troubled financial firms without risking taxpayer money. Ditto for tax "reform," in which what I consider a loophole is something you might consider a legitimate deduction. And vice versa.

I'm all in favor of clarity and simplicity, which I consider my stock in trade. But as Volcker shows, transforming simple-sounding ideas into legislation isn't simple. Proposing solutions is one thing. Writing laws is a lot more difficult.

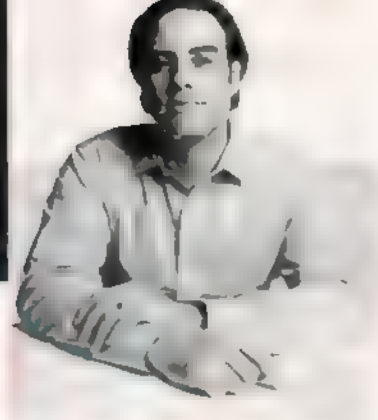
GRAPHIC SOURCE: AMERICAN BIBLE SOCIETY

Go to the tablet app to hear Allan Sloan's most recent interview on the *Marketplace Morning Report*.

Venture Capital Will Thrive Even If Tech IPOs Don't



VENTURE CAPITAL REBOUND Some investors were ready to write the obituary for VCs before 2013 changed everything



By Dan Primack

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HERE ARE TWO BASIC FACTS about business cycles: (1) They exist, and (2) people often dispute that, particularly in the midst of a prolonged top or bottom. So it has been for venture capital since the dotcom bubble burst more than a decade ago, with even industry insiders adopting defeatist language about their "broken model." The worst came in 2010 when median 10-year performance turned negative and a slew of longtime institutional investors began to abandon all but a small handful of VC firms. If venture capital had always been a cottage industry, it had become that cottage's supply closet.

In 2013, however, the negative narrative flipped with ferocious speed: more IPOs, rising returns, and broad-based success that included, but was not defined by, Bay Area Internet companies. The turnaround knocked nonbelievers upside the head with giant bags of money and will help enable the next great wave of innovation. Even if tech valuations sag or the stock markets sink, venture capitalists will have full wallets. By proving the cycle, 2013 has created something sustainable for 2014 and beyond.

Venture capital isn't required to start a business, but precious few companies are able to scale successfully without it—something that even the most critical entrepreneurs seem to recognize. It's the difference between building an app that Twitter buys after eight months and actually building the next Twitter (which raised more than $600 million from over a dozen firms).

For quite some time, though, widespread access to that money and advice appeared threatened. Fewer and fewer firms were able to raise new funds, and most of them looked remarkably similar to one another. That may have been okay for a small subset of well-networked entrepreneurs within the "right" geography and discipline, but many more would be left out.

That's where 2013 came in. The headline was the high volume of IPOs, but the underlying story was the breadth of issuers and investors. For example, more than 40% of the year's offerings came from life sciences companies (a practice area that many generalist VC firms had begun to either deemphasize or eliminate altogether). Commerce also rebounded, for both digital issuers like Zulily (a Seattle-based flash-sale site for moms) and physical ones like Potbelly (a Chicago-based sandwich-shop chain). Also note the geographic diversity, which was buttressed by more traditional plays like San Francisco–based Twitter.

And the more diversity in industry and geography, the greater number of VC firms that are typically involved. This is reflected in performance data from Cambridge Associates, which showed significant improvement in median returns between June 30, 2012, and June 30, 2013, for one-year internal rates of return (up 48%). Five-year (up 17%) and 10-year (48%) rates also rose sharply. That means more and more firms should be able to raise new funds, thus expanding the pool of funding sources for entrepreneurs.

Unfortunately, institutional investors such as university endowments and public pensions don't seem to be playing along. A recent survey by Coller Capital shows that while these groups have become more optimistic about future performance—two-thirds expect annual returns for North American VC to top 11%—a majority still plans to decrease VC fund exposure over the next several years. A similar survey from Probitas Partners showed a record 43% of respondents saying that they no longer invest in VC funds at all.

I expect the spigots to loosen. It took institutional investors a while to wean off of venture capital after the dotcom crash, and a similar lag may be occurring here (albeit in the other direction). All these folks can read the data. Now what they need to do is realize that it signifies the existence of a VC cycle rather than an uptick on the descent toward oblivion. Entrepreneurs are counting on this epiphany.

Subscribe to Dan Primack's daily newsletter at GetTermSheet.com.

GRAPHIC SOURCE: CAMBRIDGE ASSOCIATES

Will Allowing More Foreign Workers Shrink the Salary Gap?

By Nina Easton

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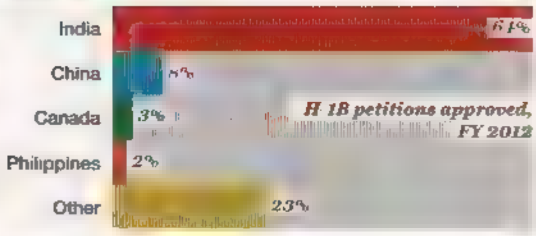

WHERE THE BRAINS ARE? India and China lead the pack in H-1B petitions approved by country of birth

THOSE LOOKING TO ASSIGN BLAME for income inequality in the U.S. have no shortage of institutions to cast as villains. The left's perennial bad guy is Wal-Mart, most recently targeted by union leaders demanding that its new Washington, D.C., box stores pay 50% above the minimum wage (labor lost that battle). On the political right the culprit is often the Latino illegal immigrant, who stands accused of taking Americans' jobs and keeping wages low by working off the books. And just about everyone cringes at CEO salaries that average 273 times that of their employees.

The policy prescriptions are just as familiar as the villains' names: Raise wages at the bottom. Raise taxes at the top. To those old debates, Alan Greenspan offers up a provocative new idea: Let firms recruit as many brainy foreign employees to American soil as they want. In other words, instead of raising the cap on specialty green cards and H-1B visas, as the Senate-passed immigration bill does, drop the limits altogether.

The result? The former Fed chair argues that the subsequent crush of high-skilled foreign talent would squeeze salaries at the top. (That's probably you, *Fortune* reader.) "They'd be competing for jobs against us—the well educated and high skilled," he says. "Including me. I don't know how many economists, but there would be some [foreign hires]." And there would be a bonus for lower-income workers: This infusion of talent would boost economic growth—and more jobs.

The demand for H-1B visas is huge and growing. Within days visas for 65,000, plus 20,000 advanced-degree holders, are filled each year, even with a regulatory stipulation that they can be granted only for jobs "so specialized and complex that the knowledge required to perform the duties is usually associated with the attainment of a bachelor's or higher degree." (Companies have to attest that none of their U.S. employees will be displaced, but they don't have to prove that no other Americans are available.)

Loads of those visa applications come on behalf of foreign graduates and postgraduates from U.S. universities who otherwise will take their degrees home to compete against American firms. Last year a record 800,000 foreign students attended U.S. universities, and many study science or business. If the gates were open to more of those students, "they'd force prices and income down in the upper-income groups," Greenspan tells me. "Not by a large amount, but it would be measurable."

I've argued here that giving U.S. companies more leeway to hire foreigners reduces their incentive to invest in the skills and education of the American workforce. If Microsoft can pull all the employees it wants out from the Indians and Chinese and Brazilians populating Ivy League corridors, why bother investing in U.S. schools?

Greenspan, author of the new book *The Map and the Territory*, counters that there is no cause and effect on this score. Indeed, even with lower H-1B caps in place, the U.S. education system has stalled. A troubling OECD report released in November showed our 15-year-olds stuck far behind students in other developed countries in math, science, and reading. Despite outspending almost every other country, the U.S. came in 26th (out of 34 countries) in math and 21st in science. "Companies would love to train them, but the students who come out of American high schools are much lower quality than they used to be," says Greenspan.

America's widening income gap is the result of a complex stew of globalization, people-replacing technologies, and slowing educational attainment from the middle class on down. Toss into that stew other ingredients—like the huge salary premium granted to college grads, and the fact that a growing majority of low-income kids are born to single mothers and will struggle more. Greenspan's idea can't reverse any of that. But it does serve as a reminder that after 30 years of a widening income gap, we should consider thinking outside the usual boxes. ■

GUCCI, CHANEL, and ... QEELIN?

Chinese consumers have long had a voracious appetite for Western luxury goods. Now the fashion conglomerate Kering is betting that they'll covet one of their own—a high-end Asian jewelry brand—and that soon the rest of the world will too. *By Jennifer Reingold*

I HAVE A *WULU* AROUND MY NECK. That's the Mandarin word for gourd, and a famous good-luck symbol in Asian culture roughly equivalent to the horseshoe in the West. I definitely do feel lucky today, because this particular *wulu* is inlaid with tiny, brilliant diamonds and retails for about $50,000 at Qeelin (pronounced KEE-lin), the Asian jewelry company now owned by French luxury giant Kering (formerly PPR). ¶ From my perch on a sofa in Qeelin's sleek Hong Kong boutique, my luck continues. Co-founder and creative director Dennis Chan lets me model a diamond- and ruby-encrusted panda whose joints swivel and move (price: roughly $60,000), a lotus-flower ring that twists open to reveal an inner flower ($43,000), and many other pieces of jewelry with symbolic meanings in Asian culture. Named for a mythical Chinese creature, Qeelin has 19 stores in Asia and Europe, where—now with the help of Kering—it is trying to become one of the first successful luxury jewelry brands originating ... in the East. Such celebrities as Katy Perry and Kate Winslet are already fans of the jewelry, which teeters on the edge between sophisticated and kitschy and ranges in price from $440 for a tiny pendant to $600,000 for custom-made pieces.

But why, one wonders, would Kering, the $13.4-billion-in-2012-sales company that owns Gucci, Saint Laurent, and Bottega Veneta—venerable European brands now increasingly dependent on the new Asian wealthy for their sales—buy a 10-year-old upstart, especially one bent on proving that great quality isn't the sole provenance of European craftsmen? In part, Qeelin fits with Kering's strategy of buying top brands in areas where it doesn't already compete. But another major reason is that François-Henri Pinault, CEO and chairman of Kering, believes the new wealthy in China will increasingly support homegrown brands rather than always importing them. "[Qeelin] has all the components of a global luxury brand," Pinault says. "It is very demanding in terms of craftsmanship and has strong design. And let's not forget that China is one-fifth of the world population. So if a Chinese brand could succeed with the Chinese, then it's very interesting to take that bet."

Kering is not the first foreign company to take that bet. Its purchase of a majority stake in Qeelin is just the latest in a series of similarly well-intentioned but not-too-successful deals over the past decade, starting with Richemont's 1998 purchase of Shanghai Tang, a Hong Kong–based retailer of Asian-inspired clothing. There are also Shang Xia, a Chinese brand co-created by Hermès, and a few others, but so far they've remained niche plays that haven't really caught on in the mainland, let alone overseas. With just $40 million in estimated sales—Kering does not disclose the actual figure—Qeelin is small in terms of actual revenue, but it is emblematic of Kering's desire to win in the race to develop a true Chinese luxury brand.

Co-founder Chan is ready for the challenge. A well-known industrial designer who created Taiwan's national phone booth and started his own design firm, Longford, before turning

Qeelin BoBo pendant, $43,200

"Some fashion designers just pick a Chinese motif—for example, a dragon—and put it into fashion. For Chinese people this is like a joke."

—Dennis Chan, co-founder and creative director, Qeelin

A Qeelin store in Pudong, Shanghai

to jewelry, he says what sets his brand apart is authenticity. "I think Qeelin is more genuine," he says. "It is really created from an Eastern perspective, and at the same time we are offering something at the international level in terms of design, quality, and service."

Although Chan himself is from Hong Kong, not mainland China, and his co-founder, Guillaume Brochard, is a French resident of Shanghai, the collections themselves play on deep roots in Chinese culture. Qeelin's first collection, in 2004, was inspired by a trip to Dunhuang, a town in the middle of the Gobi desert whose centuries-old cave paintings showed Buddhas and others wearing traditional jewelry.

To a Westerner, Qeelin's pieces are decorative and fun—almost childlike—but to an Asian, they have important and often auspicious meanings. Bells, for example, are a common gift to protect newborns against evil spirits, and the symbol of the longevity lock (*Yu Yi*), which means "your dreams come true" and stands for security, is a common theme. "Some fashion designers just pick a Chinese motif—for example, a dragon—and put it into fashion," says Chan. "For Chinese people this is like a joke."

But there are also modern shapes like robots that are not at all Chinese. "I wanted to let people know what contemporary Chinese design could be," says Chan. "I don't want people talking only about the Ming Dynasty."

Today, of Qeelin's 19 stores, nine are on the mainland, with the rest in Hong Kong, Europe, Tokyo, and Singapore. Six have opened since Kering bought in. In Europe there are boutiques in Selfridges and Colette, as well as standalone stores; the clientele there is about 15% Chinese, and the rest is European, Middle Eastern, and Russian. Hence the $64,000—or is it the $640,000—question: Could Qeelin eventually transition from a China play into a global luxury brand, as coveted by Westerners as a Birkin bag is by Asians? Yes, but Yuval Atsmon, a partner at McKinsey specializing in China, says that for now the goal is still to win with Chinese customers. "Part of having a presence in Paris or London can be about bringing credibility back home," he says. "If I'm a Chinese tourist on the Champs-Élysées and see a Chinese brand sitting there next door to Chanel, it helps."

Yet Kering's purchase, which closed in January 2013, comes as China's growth has slowed and the new Xi Jinping government has cracked down on extravagant gift giving by the political class. On a recent visit to Qeelin's store near the Park Hyatt hotel in Beijing's Yintai Center, the store was empty; when asked about store traffic, a saleswoman said, "Oh, no busy."

This slowdown is impacting all luxury retailers in China. High-end watches there have suffered double-digit declines, according to Luca Solca, managing director at Exane BNP Paribas. And Kering's most important division, Gucci, saw overall sales rise just 0.6% in the third quarter of 2013, both because of the gifting issue in China and also because items with big logos, obvious status symbols for the upwardly mobile, are now being rejected by the new elite, who want items perceived as even more exclusive. Gucci is now reconfiguring its product line to include fewer logos and more handbags and other ultraluxe items that only the truly elite will recognize.

THERE'S GOOD REASON Qeelin gems could fill that bill too. High-end jewelry remains a very fragmented market and is growing quickly even amid the overall slowdown—up in the high double digits annually in China, says Solca. And since only 20% of the global $75 billion industry is branded, according to estimates from Bain and Altagamma, there is an opportunity to build a local name. The Chinese are beginning to embrace Western habits too, such as giving engagement rings, which are showing an annual growth rate of almost 24%, according to Vontobel Research.

There is also the psychological element of how a rising culture expresses itself, especially one as powerful and long-lived as China's. Although today luxury is about being able to afford the best goods of the West, many China watchers say the next step is to export the culture in the other direction. Says Solca: "It's like an option call. This is a way to get some exposure to Asian brands at a time when it's not clear what the consumer may want to buy in five to 10 years." Will that be bejeweled panda pendants? Kering will be ready if it is. ■

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SAMSUNG

THE NEW KOCH

Koch Industries may be known as an oil company. But the vast private business empire run by billionaire brothers Charles and David Koch is expanding into vital industries like food, water, and personal technology.

[illegible]

[illegible] exactly the first place you'd expect to find an information technology evangelist. It's about 1,600 miles away from Silicon Valley and even more distant culturally and politically. Located on the northeast fringe of Wichita, where the city streets give way to open expanses of prairie grass, the campus of one of America's largest private companies has grown over the years to support an expanding oil and gas empire.

But when Koch CFO Steve Feilmeier was asked recently about the future of the U.S.

ILLUSTRATION BY HELLO VON

Charles (left) and David Koch have greatly expanded the company founded by their father

KOCH BY THE NUMBERS

Koch's annual revenues, which have nearly doubled over the past decade. If it were publicly traded, the company would rank No. 17 on the *Fortune* 500.

Number of people employed by Koch worldwide in 2013, spread [redacted] than 50 countries. Roughly 3,000 work at the company's headquarters in Wichita.

Recent price paid by Koch to acquire Molex, a global electronics manufacturer that brings $3.6 billion in sales and 36,000 employees.

economy, he launched into a spirited monologue about the bright prospects for the nation's high-tech industry. "It's the little things, like these BlackBerrys that didn't exist eight or 10 years ago," said Feilmeier, holding up his distinctly last-century smartphone and growing animated in his modest office along executive row. "These technologies have improved the quality of our lives tremendously. That's going to continue, very rapidly." ¶ In early December, Koch Industries put some serious money behind that belief when it closed on its $7.2 billion acquisition of Molex, a global electronic components manufacturer headquartered in Lisle, Ill. Molex makes parts for a wide variety of gadgets, including iPhones, and was traded on Nasdaq before the buyout. Koch sees huge potential for Molex to benefit from the so-called Internet of Things revolution that's on the horizon. (See "Everything Is Connected" in this issue.) "Think about sensors and connectors and how [they're] proliferating right now," says Feilmeier, a stout 52-year-old who has the rah-rah intensity of a high school football coach. "As technology becomes more user-friendly and machines become wired to be more proactive—whether that be industrial robotics and automation, or you have automobiles doing more for you and telling you more and keeping you out of accidents—we think Molex is really well positioned to capture that growth."

Feilmeier envisions Molex growing from today's $3.6 billion in revenue to $10 billion within a decade and says there are hundreds of smaller tech companies that could be acquisition targets. "They just weren't out acquiring those companies or those technologies to enter new markets, and we'll really be able to help them with that," he says.

To the degree that most people have heard of Koch (pronounced "coke"), it is likely because of the political activities of the company's primary shareholders—the brothers Charles and David Koch. Thanks to the tremendous growth of the family company founded by their father, Fred, more than 70 years ago, the Kochs are among the very wealthiest people in the world today. Each brother has a net worth estimated at $36 billion or more, and as their fortunes have grown, they have been aggressive about using their money to influence the political conversation in the U.S. The Kochs are staunch libertarians—David ran for Vice President on the Libertarian Party ticket back in 1980—with a distaste for big government and, some would argue, regulation that might infringe on the profitability of their businesses. Money from the Koch brothers helped fund groups that spawned the Tea Party movement. One of the prime vehicles for their efforts is the Koch-sponsored political advocacy group Americans for Prosperity, which has taken on an array of political fights—from repealing Obamacare to fighting the power of public sector unions in Wisconsin. According to a recent study by the Center for Public Integrity, AFP spent $122 million in 2012 alone. But that is hardly the extent of the Kochs' political spending. They have given tens of millions to help support a network of other conservative organizations. As a result, the brothers have become outsize figures in America's partisan political narrative—all-purpose bogeymen to those on the left.

All the attention on the Koch brothers' politics, however, obscures the story of how their sprawling conglomerate has become one of the most important companies in America. If Koch Industries were eligible, its $115 billion in revenues would be enough for it to rank No. 17 on the *Fortune* 500, with sales larger than those of Google, Goldman Sachs, and Kraft Foods combined. It has doubled in size in the past decade. But Koch isn't important just because it's big. As Koch grows, it is reaching into new areas of business and becoming more closely entwined with more consumers. Koch owns well-known brands such as Stainmaster carpet and, thanks to its $22 billion purchase of Georgia-Pacific in 2005, Quilted Northern toilet paper, Brawny paper towels, and Dixie cups.

While it began as an oil company, Koch today operates more like a giant private equity fund. It is essentially a massive pool of cash that is looking to invest wherever it sees the

This fertilizer plant in Enid, Okla., is part of Koch's rapidly growing and highly profitable agribusiness portfolio

S. POGROCKI, ASSOCIATED PRESS

potential for long-term profits. When the company moves into a new industry, it does so strategically and patiently. Just 10 years ago, for example, Koch was a minor player in the fertilizer business. Then it made a series of quiet investments that turned it into the third-largest maker and distributor of fertilizer products in the U.S. Now Koch occupies a crucial role in the world's food system—a position that the company is using as a beachhead for further investments in agribusiness.

To better understand Koch's strategy and its methodology, *Fortune* spent months interviewing current and former executives of the company, poring over available documents on the private company, and talking to competitors. What emerged was a picture of a highly disciplined organization that plans to play a critical and growing role in delivering electricity, food, technology, and, one day, maybe even tap water.

I**T ALL REVOLVES** around the mind of one man: Charles Koch. People tend to refer to the Koch brothers as a single entity, but David, 73, the younger of the two, is clearly the junior partner inside the company. David retains the title of executive vice president, but he has long lived in New York City and spends much of his time involved in public-facing roles like philanthropic giving. In 2008 he pledged $100 million to Lincoln Center and got a theater named after him. Charles, 78, lives in Wichita and has held the titles of CEO and chairman since his father, Fred Koch, died in 1967. Charles and David Koch declined to be interviewed for this article.

Based on Koch's growth, there is a strong case to be made for Charles as one of the elite business executives of the past half-century. When he took the reins of the company nearly 50 years ago, Koch had around $200 million in revenues (vs. $115 billion today). He has steadily built on the foundation left by his father. Fred Koch, the son of a Dutch immigrant, studied engineering at MIT and invented a new method of converting oil to gasoline in the late 1920s. He worked in the Soviet Union under Joseph Stalin for a time before returning to the U.S. to found his own refining company in 1940. One of the original members of the John Birch Society, Fred imparted his conservative values to his four sons. Yes, four. David's twin, Bill, is a businessman and sailor who won the America's Cup back in 1992 and more recently made news by leading the fight against wind turbines off the coast of Cape Cod. The eldest Koch brother, Frederick, 80, is a collector and philanthropist. In 1983, Charles and David bought out Bill's and Frederick's shares in the company for just over $1 billion—spurring a long-running family feud that in the

> "Managers don't dare fudge numbers when they stand in front of Charles Koch. "If you don't know something, you'd better say you don't know," says one former company exec. "Do not try to dance."

1990s led to a contentious lawsuit by Bill and Frederick claiming that they had been underpaid and ended in 2001 with an undisclosed settlement.

The structure of Koch Industries today would probably be unrecognizable to Fred. There is a central group, officially called Koch Equity Development, which reports directly to Charles and other senior executives and which operates like a high-level think tank, evaluating potential deals, sometimes on a 10- to 15-year horizon. The company also has smaller development groups in its different divisions, such as Koch Fertilizer and Koch Minerals. These groups constantly scan the landscape of their respective industries for potential deals, feeding information back to the central group. Koch spends roughly $100 million a year to fund the research in its development groups, according to Feilmeier.

The company also leverages other means of intelligence gathering—for instance, its massive commodities trading operation. Koch is the world's fourth-largest commodities trader, according to a 2011 ranking by Reuters, with trading floors in Houston, New York, Geneva, Singapore, and Wichita. Koch's traders buy and sell contracts on a wide range of commodities, from oil to silver to orange juice. In addition to generating profits, Koch's traders act as scouts in the marketplace, according to current and former senior employees in the trading division. This helps Koch as it looks for new deals and new companies to buy. For example, Koch's trading unit began buying and selling petrochemicals called olefins in the late 1990s because the market was undertraded and attractive, according to a former senior trader. In 2007, Koch bought a group of olefin plants from Huntsman Corp. as part of a $770 million transaction. The deal relied, at least somewhat, on analysis of the olefin market developed by the traders.

Each of Koch's major divisions reports to Charles Koch and other top executives at least every quarter with an update on their business. These meetings are not perfunctory. Every business unit of Koch is potentially up for sale all the time, and executives know it. They don't dare fudge numbers or gloss over shortcomings when they stand in front of Charles Koch. He is known to pierce weak arguments with a single question.

"It is intense," said Jeremy Jones, who from 2007 until 2009 was vice president of Koch's internal venture capital fund, which worked closely with Koch's central development group. Jones learned the hard way when he pitched an investment in biofuels to Charles. After Jones made his case, Charles began grilling him in his no-nonsense style. Had Jones considered the fact that ethanol delivers only 66.7% of the energy of gasoline? Did his forecasts incorporate the fact that there was a government mandate for ethanol use, which could change? "My analysis was built on faulty assumptions," Jones recalls. "He was really quick to figure that out. If you don't know something, you'd better say you don't know. Do not try to dance."

Once Koch commits to an investment, the company employs a rigorous approach to running the business that Charles has refined over decades. He has codified this approach into a philosophy that he calls Market-Based Management®. (Yes, he uses the registered symbol when writing about it.) In 2007, Charles published a book called *The Science of Success*, explaining how the system works at Koch. MBM, as Koch employees call it, lies at the heart of how Koch operates every day. There isn't a lot of art on the walls in Koch's headquarters, but everywhere you turn there is a copy of MBM's 10 guiding principles hanging from the wall. When employees get a free cup of Starbucks coffee in the break room, the principles are printed on the disposable cup.

The influence MBM has on Koch employees cannot be overstated. "It's your life, man," says one former senior Koch executive who worked closely with Charles Koch for many years. This executive said that the importance of MBM doesn't lie just in its concrete advice. MBM is critical because it unites Koch's employees, giving them a common language and a common goal.

It can be maddening to try to understand MBM from the outside. The belief system can seem like little more than a grab bag of management consulting clichés. For example, the 10 guiding principles of MBM include malleable terms such as value creation, integrity, change, and principled entrepreneurship. But there is something very real at the heart of MBM, and in turn at the heart of Koch Industries' corporate culture. And the only way to understand how Koch really works is to delve into specifics. There is no better case study for this than Koch's fertilizer business.

David Koch, at opening night of *The Nutcracker* at the Brooklyn Academy of Music in 2010, lives in New York and is a longtime trustee of the American Ballet Theater

PATRICK MCMULLAN.COM

IN 2002 a company named Farmland Industries, which owned a network of nitrogen fertilizer plants, was forced to declare bankruptcy and began selling off its divisions. The following year Farmland held an auction for its fertilizer plants in a conference room at its headquarters in Kansas City, Mo. The room was lined with glossy posterboard photos of the plants, designed to entice a bidding war. But only two companies showed up: the fertilizer giant Agrium and Koch Industries.

Koch's presence was puzzling to outsiders. Why was an oil company interested in buying fertilizer factories, at the very moment when those factories were least profitable? What outsiders didn't know at the time was that Koch had been studying Farmland for years, in just the same way that Koch is studying other industries and companies today. This kind of analysis happens inside Koch's central development group. When evaluating a deal, Koch executives focus on three key criteria:

1. The business in question must be in trouble. When a company is humming along, there's not a lot of upside. If it has some sort of huge problem, there's a better chance that Koch can reap profits from its recovery.

2. The deal must be a long-term play. Most public companies need to show good results on a quarterly basis. Even private equity funds need to show their senior investors that investments are paying off in at least a few years. Koch doesn't. Being privately held means the company can think in terms of decades.

3. Koch needs to have key skills (or "core capabilities" in MBM lingo) that will benefit the company. Koch doesn't just bring money to the table. It brings knowledge. And if Koch doesn't already know something important about running the business in question, it will pass on the investment.

Koch's development group pores over the details of any possible deal and conducts a series of futures studies, gaming out what might happen in any given industry over the next 10 to 15 years, according to current and former Koch executives, including Brad Hall, who ran the group in the late 1990s. The development group then charts out the possible outcomes into a kind of bell curve, with highly likely scenarios in the middle and unlikely, "black swan" scenarios on the edges. If a deal is profitable under enough of the likely outcomes, Koch will make a move.

In the early 2000s Koch's small fertilizer business was doing just this kind of analysis. Steve Packebush, a young employee in the unit, was on the team that started analyzing global supply and demand trends for fertilizer. At the time Koch owned only a small plant and some pipelines that transported fertilizer ingredients. Then, in 2002, natural-gas prices shot up, dramatically increasing the manufacturing costs for nitrogen fertilizer makers and putting companies like Farmland under duress. Nitrogen fertilizer may sound like an agricultural commodity, but it's actually an energy product because the main input in the manufacturing of nitrogen fertilizer is natural gas.

Packebush's group saw an opportunity in the price spike and recommended that Koch take advantage of the market turmoil and buy more fertilizer factories. At the time the U.S. fertilizer industry was in a deep hole, and about 40% of U.S. production had been knocked out of business. That meant the surviving factories were the most efficient and would benefit when the industry rebounded, Packebush said. Farmland's fertilizer plants were particularly attractive because they were located in the U.S. Cornbelt, stretching from Oklahoma to Iowa. That gave the plants a slight price advantage over imported fertilizer, which had to be shipped in from the Gulf Coast.

Charles Koch and the board gave their approval for the fertilizer business to invest when the right opportunity appeared. So in 2003, Packebush went to the auction at Farmland's headquarters and outbid Agrium. Koch walked away with the fertilizer plants for pennies on the dollar in a deal valued at $293 million. Koch soon began applying its "core capabilities" to the business by investing about $500 million over a decade to upgrade the fertilizer plants and other infrastructure, running the operation with the same eye for efficiency Koch uses at its oil refineries.

Then Koch Fertilizer was given a big boost by a scenario that almost no one saw coming. Beginning around 2008, hydraulic fracturing, or "fracking," technology opened up enormous reserves of natural gas in the U.S. Supplies jumped and prices plummeted. Koch was suddenly buying its primary feedstock at about half the cost that Farmland paid when it went bankrupt. But retail fertilizer prices remained high, because record-high corn prices incentivized farmers to buy as much fertilizer as they could use. The spread between cheap natural gas and expensive fertilizer translated into pure profit for Koch.

The mix of luck and skill has made Koch Fertilizer one of the company's largest divisions, and one of its most important. Koch CFO Feilmeier said agribusiness is one of the top areas where Koch will be looking to expand in coming years, and many of the deals could be made through the fertilizer unit. "The fertilizer business is right in the center of agriculture," Feilmeier says. "Here's the problem the world has: We're at [a population of] 7 billion people today, 9 billion by the year 2030, okay? How are we going to feed them?"

Charles Koch, here in 2007 has been CEO and chairman of the family company since 1967

BO RADER WICHITA EAGLE MCT GETTY IMAGES

KOCH IS NOT particularly bullish about the economy right now. Feilmeier says the company is expecting sluggish growth in the near future. But there will be bright spots. Constant innovation in electronic devices will boost demand for high-tech manufacturing. The Molex deal, of course, is a means of capitalizing on that trend.

Another long-term trend that Koch has identified is the need for utility companies to reinvest in the electricity grid. One surprising way Koch plans to benefit from this is by entering the steel business. It recently invested in a $1.1 billion mill being built in Osceola, Ark., by Big River Steel. Koch won't say how much money it invested, but steelmaker Nucor estimates that Koch is getting a 40% equity stake in the plant by putting in a mere $125 million. The investment is relatively small for Koch, but that's how the company often enters a market—making small deals at first, the kind of low-stakes experiments that allow it to learn and fail on the cheap. For example, Koch got into the forest products business cautiously in 2004 when it bought pulp mills and other holdings for $610 million from the timber company Georgia-Pacific. After briefly operating those mills, Koch suddenly bought all of Georgia-Pacific the following year.

Feilmeier said Koch was attracted to the Big River Steel deal because the mill will be the only large-scale producer in the U.S. of electrical-grade steel used to make transformers, power lines, and other equipment used in the specialty grids of tomorrow. "What we see is an opportunity to help the U.S. retool itself on the electrical grid, and this plant is being positioned to do that," says Feilmeier. "So we learn a lot. We bring a lot. And it potentially puts us into new markets 10 and 20 years from now that we're not in today." Does that mean that Koch could eventually make a multibillion-dollar bid to take a steelmaker like Nucor private, as it did with Georgia-Pacific? "Maybe so, if they have a problem that we can help them solve!" says Feilmeier.

Koch's investments in steel and electronics are plainly visible. But the company is also making quieter deals in the background. One of the most intriguing of these investments has to do with the most precious natural resource on the planet—water. Koch is among a handful of companies that are building the foundation of a privatized water industry. The investment thesis is simple: Fresh, clean water is increasingly scarce, and demand is growing. Booming populations in the developing world are outstripping freshwater supplies, creat-

"Koch is among a handful of companies that are building the foundation of a private water industry. The investment thesis is simple: Fresh, clean water is increasingly scarce, and demand is growing.

ing strong demand for machines that can desalinize seawater or purify polluted streams The market to desalinate water is expected to grow 9.5% year over year between 2012 and 2016, according to the market research firm TechNavio. "I think it could be a great business," says Jones, the former vice president at Koch's venture capital fund. He says he pushed water investments during his time there. "Fresh water, pure water, usable water: It's not an asset that's growing right now."

Koch is making a quiet push into the water business through a unit called Koch Membrane Systems, based in Wilmington, Mass. The division was originally founded to sell equipment that purified wastewater at industrial sites like Koch's oil refineries. Scientists at Koch Membrane Systems became experts at making high-tech water plants that could fit in a small amount of space. In the 1990s the group started buying technology that opened the door to purifying water supplies for consumers rather than oil refineries, says Steven Iannelli, who worked for Koch Membrane Systems from 1991 until 2000 and left as vice president of the division's development group.

Today Koch offers a range of water products and services. It is selling its water-purifying systems to U.S. cities like Franklin, Mass., and pushing to expand overseas. Koch has sold desalination systems to a power plant in China and a mine in Chile. It has also supplied, to U.S. Department of Defense contractors, technology for portable water plants that can make drinking water out of saltwater or other sources that are polluted by chemicals and even nuclear waste. Then there is Koch's Puron Plus system, a prefabricated water plant that can be made to order for cities or factories to install. Koch makes Puron "packaged plants" that can be quickly built to order, with the filtration systems set up in different floor plans designed to fit into small spaces. Products like this could help overcrowded cities that need new wastewater-treatment plants but don't have a lot of space to house them.

Koch's water business is still tiny compared with the company's oil refineries and fertilizer plants. But the company sees potentially huge profits down the road. Feilmeier says that Koch has been offered "many hundreds of millions of dollars" for the group of patents it has developed around water technology. "We're not willing to do it, because we think we can take that technology and get it commercialized in the markets," he says.

ONE ASPECT of Koch's long game that remains unclear is who will run the company after Charles Koch. The energetic 78-year-old doesn't seem ready for retirement anytime soon, but succession plans are important for a company that invests with 20-year horizons. Nobody interviewed for this story suggested that David Koch would take over the company. Speculation tends to focus on the small coterie of lieutenants who work closely with Charles, including CFO Feilmeier and the company president, 51-year-old David Robertson. But there is one young up-and-comer at Koch who generates more speculation than anybody: Charles Chase Koch.

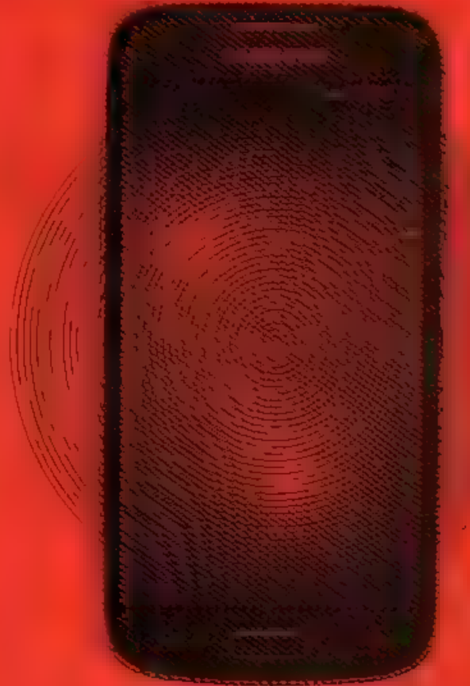
Charles Koch's son, known as Chase, inherited his father's sense of fierce competition, say those who know him, and was a nationally ranked tennis player by the time he was 12. Now 36, Chase studied business at Texas A&M and joined Koch Industries in his mid-twenties. It appears that he is being groomed for leadership. Chase has shadowed senior executives and other employees in different divisions of Koch since being hired. He is now a vice president of Koch's agronomics division, and in early 2014 he will be promoted to president of Koch Fertilizer, helping to guide the company's expansion efforts. The company declined to make Chase available for an interview for this story.

Whoever becomes the next CEO of Koch Industries must prove that the company is more than just the product of Charles Koch's business acumen—in some ways similar to the challenge handed to Apple CEO Tim Cook and his executive team after Steve Jobs' death. And the next leader of the company will be working with a transformed portfolio of businesses. As Feilmeier puts it, "When we buy something, it's with an intention of holding it forever." Someday, maybe people will talk about Koch Industries as a tech company. ■

THE FUTURE ISSUE

For today's innovators the technological advances consumers now enjoy (e.g., access to much of the world's information in the palm of your hand) is old news. They've moved on to developing the next generation of life-changing products. *Qualcomm*, the company that helped stoke the mobile-phone revolution, wants to change the future by embedding its technology everywhere (see page 36). *Google* is investing in "moon shots" that would seem to have little to do with building a better search engine (page 42). Newcomer *Snapchat* (page 48) is changing the way a new generation communicates. Actor *Robert Downey Jr.* (page 46) knows about invention. He tells *Fortune* that in order to win the role of Tony Stark, the businessman-turned-superhero in the Iron Man films, he needed to imagine himself, and his future, in a completely different light. Once he got the role, Downey tapped the brainpower of a big-time inventor: SpaceX and Tesla CEO Elon Musk.

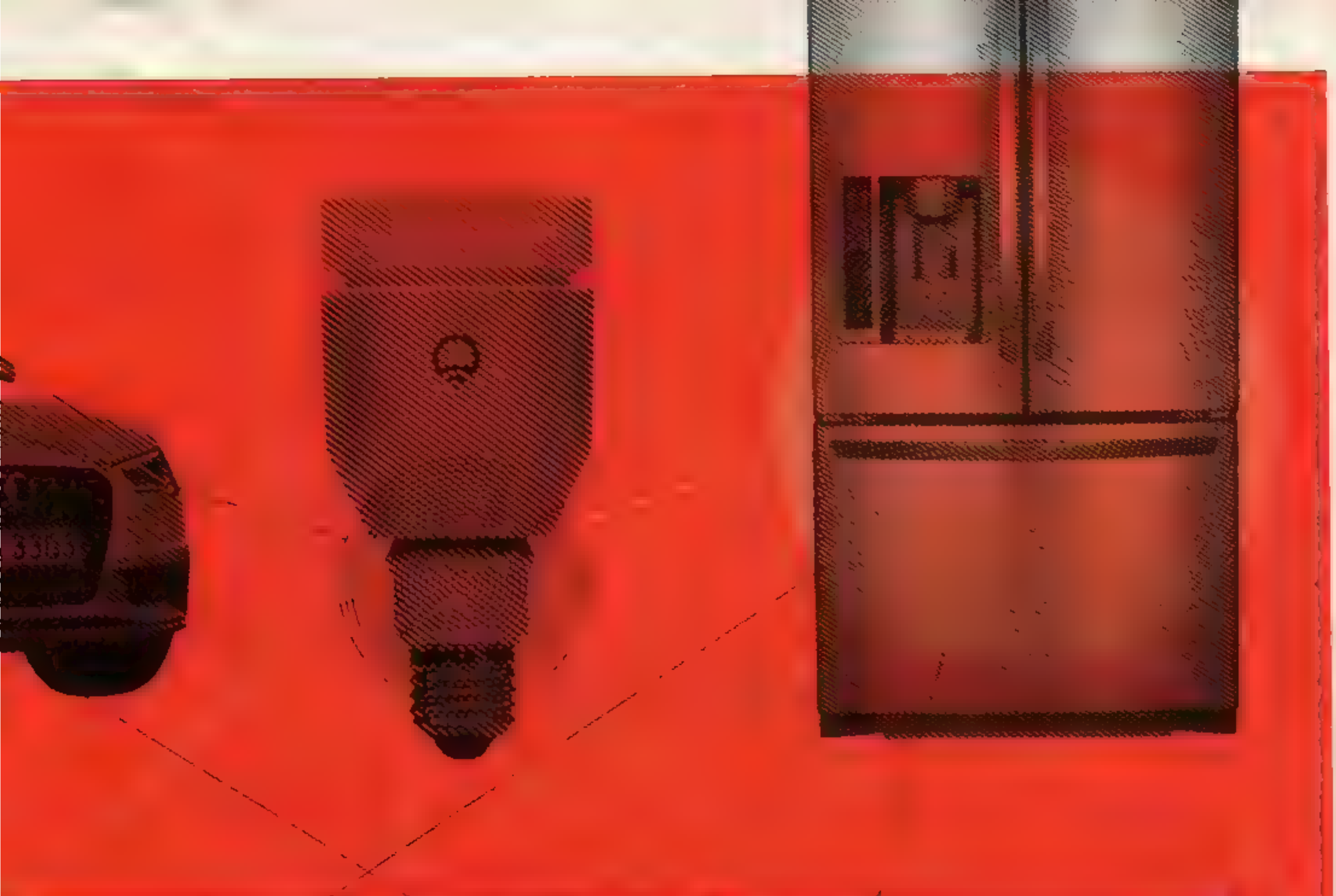
—*Stephanie N. Mehta*



EVERYTHING IS

Qualcomm, the company that brought you ubiquitous mobility, is now on a quest to connect all things to the Net.

BY MICHAL LEV-RAM



CONNECTED

In late 2013 it launched the Toq, a "smartwatch" that sends email and other notifications straight to users' wrists. Pronounced "talk," the new device was a departure for the semiconductor company, which has largely remained behind the scenes even as its technology ignited the smartphone revolution. But the Toq wasn't the chipmaker's only deviation from the norm. Lately it seems Qualcomm is doing everything it can to shed its image as a nerdy purveyor of microprocessors and radio chips for phones and wireless networks. Long a stalwart at telecom trade shows, Qualcomm last year secured the keynote slot at the glitzier Consumer Electronics Show, serving up a wide-ranging presentation that previewed its

This electric ear thermometer is one of the many smart devices that will connect to the Toq watch.

forthcoming watch, highlighted an all-electric Rolls-Royce charged up by Qualcomm technology, and touted an augmented-reality application demonstrated by *Sesame Street's* Big Bird. It also unveiled a software platform that allows all sorts of household gadgets to communicate with one another.

Qualcomm isn't rejecting its past; rather it is trying to expand its potential market by bringing wireless connections to tens of billions of devices, from mundane items like washing machines and coffeemakers to lifesaving tools like defibrillators and pacemakers. The vision is simple: If everything is connected to the Internet, those items can tell the network, and by extension a consumer, when something is wrong (an irregular heartbeat or an intruder in the garage), an object is missing (the fridge knows there's no milk), or conditions have changed (traffic on the highway has cleared). The consumer, or another device, can in turn talk back and alert a doctor to the heart issue, send a homeowner a reminder to stop at the store, or, in the not-so-distant future, program the car to take the freeway home.

This concept of the Internet of Things is hardly new; the term dates back to 1999. But Qualcomm, which reported almost $7 billion in profits on $25 billion in sales in the 12 months ended Sept. 29, is breathing life and considerable resources into the effort. The San Diego–based tech giant will spend a chunk (it declines to say exactly how much) of its $5 billion annual R&D budget to make what it calls the "digital sixth sense" a reality.

Qualcomm's effort to redefine itself comes as the company is undergoing another transition: In mid-December the chipmaker said CEO Paul Jacobs would be replaced in March by current operating chief Steve Mollenkopf. Sources say that Mollenkopf had long been the board of directors' pick to eventually run the company, and that the directors accelerated the succession process when it learned Microsoft was courting Mollenkopf to replace Steve Ballmer as the head of the software giant. Jacobs will remain executive chairman of Qualcomm. "It's a very unique place in the industry, and I'm humbled to have the opportunity to shepherd it further," Mollenkopf told *Fortune* the day his promotion was announced.

Mollenkopf and Jacobs have an interesting challenge ahead: For its Internet of Things gambit to become a reality, Qualcomm needs to do more than retool the chips and sensors the company makes today, though that's a big task. The company needs to build other parts of the ecosystem (such as the operating language that allows devices to talk to one another) just to get potential partners to see the potential of Qualcomm's vision. Thus, Qualcomm has created AllJoyn, an open-source software platform for Internet-connected devices, and Toq, which looks a lot like a giant Casio Classic. (Okay, so maybe Qualcomm isn't ready to move into couture.)

And yet Qualcomm has played this hand before, with fabulous results. Today Qualcomm's chips are found in about two-thirds of the world's 3G and 4G broadband phones. Its components power Apple's iPhone (Apple designs its processors but uses some Qualcomm parts, such as radio chips), Samsung's line of Galaxy devices, and Amazon Kindle Fire HDX 7. Apple and Google get a ton of credit for making smartphones accessible, but there might not be smartphones if it were not for Qualcomm.

That's because Qualcomm didn't just invent stuff for the innards of the phone: Management tried to show mobile computing in action. Long before the release of the iPhone and the opening of Apple's App Store, Qualcomm built and tried to commercialize its own smartphone and app store. Back when consumers eschewed the idea of watching video on phones, Qualcomm created a business to stream live television to handsets. The company has since exited those businesses (and a few were total bombs, like the broadcast TV unit), but not before it showed the world the potential of smartphones—while selling loads of its chips and components in the process. Can Qualcomm, which has already helped radically redefine the way consumers work, communicate, play, and learn, shape the future yet again?

PAUL JACOBS has folded his lanky frame into a cream-colored Ikea armchair—and, more important, onto a teeny-tiny motion sensor that's been tucked into the seat's foam-filled cushion. He's maneuvering around a lab at Qualcomm headquarters, test-driving some of his engineers' latest innovations. Jacobs stands up, and a nearby lamp shuts off. He sits back down, and the light flickers on again.

"Here's the issue," Jacobs says, looking up at the two engineers standing beside him, eagerly awaiting his approval. "This thing is a battery-operated deal, so how does it let me know that my butt-sensor battery is out?" The engineers assure him that the sensor can be programmed to stay in sleep mode until it's activated by, well, the pressure of someone's derrière, which minimizes its power consumption. Jacobs peppers the team with more questions: What's the control interface? Does the lamp have a dimmer? How much do the added components cost? "This is a good idea," he finally says, to the engineers' relief.

WHO IS STEVE MOLLENKOPF? Go to Fortune.com to learn more.

Conversations about butt sensors and programmable lamps are becoming increasingly commonplace at the Qualcomm campus. There's an urgency to the company's push into new areas. Nearly all of Qualcomm's revenue is tied to sales of phone components such as baseband chips and application processors or licensing fees that phonemakers pay for its patents, and while there's still plenty of growth in markets like China, where carriers are now building out data-driven broadband networks, smartphone growth is declining for the first time in more mature markets. That slowdown hits Qualcomm in two ways: Its sales growth in components slows down, and its customers, the handset manufacturers, shift their energies to cheaper phones for emerging markets, phones that generate lower patent royalties for Qualcomm.

As a result, investors are clamoring for Qualcomm to diversify. Analysts at Gartner predict that the trend of turning everyday objects into data-spewing machines will help add $1.9 trillion to the economy, spread across manufacturing, health care, and other industries, over the next six years. Jacobs believes there will be an average 22 connected devices per U.S. home by 2020. "The digital sixth sense is the next evolution of smartphones and tablets," says Francis Sideco, an analyst with research firm IHS. "It will be a dynamic new market for Qualcomm and its competitors to attack."

Qualcomm and the Birth of the Cool

HERE ARE SOME OF THE PRODUCTS THE SAN DIEGO TECH COMPANY HAS PIONEERED

1993: First CDMA phone
The CD-7000 was the first in a series of CDMA-based cellphones manufactured by Qualcomm. It later sold its handset business to Japanese manufacturer Kyocera

1999: pdQ smartphone
Jacobs's vision to combine the data capabilities of a PalmPilot with voice functions found on basic cellphones finally materialized in the pdQ, the first CDMA smartphone

2001: Brew platform
Well before the Apple App Store, there was Brew, Qualcomm's attempt at a mobile-applications store and developer platform, which made over-the-air downloads possible.

2004: MediaFlo
The company announced plans to stream live network television to phones; it shuttered the unit, but not before showing that people could watch video on small screens

2007: Snapdragon system-on-a-chip
The company's popular Snapdragon line of chipsets combines wireless connectivity, multimedia performance, and superfast data processing, and is found in the Google Nexus 7 and the Amazon Kindle Fire HDX.

2013: AllSense Alliance
In an effort to ramp up the Internet of Things, Qualcomm open-source software, an extension of AllJoyn, lets devices communicate with one another, allowing any manufacturer to embed the technology in TVs, washing machines, and other gadgets

To understand where Qualcomm—and quite possibly the future of wireless technology—is going, it's helpful to look at where the company has already been. Irwin Jacobs, a former computer science professor and Paul's father, founded Qualcomm along with six other engineers back in 1985. Their mission? Commercialize CDMA (the abbreviation stands for "code division multiple access"), a digital wireless technology once used by the U.S. military for secure communications. In so doing, Qualcomm introduced a new wireless standard in the market, in competition with GSM, the system favored by Europe and much of the rest of the world. U.S. carriers ended up picking sides, with Verizon and Sprint using the CDMA standard for its digital network and AT&T picking GSM.

Qualcomm filed thousands of mobile patent applications, which forced anyone who wanted to make a phone that ran on a CDMA-based network to shell out royalties to the company. That resulted in many heated legal battles with handset makers, as even rival chip companies were forced to pay licensing fees to Qualcomm. But Qualcomm prevailed, and by 2000 it realized that its cash cow was chipset manufacturing and intellectual-property licensing; the company sold off its other businesses. But that didn't keep it from having a starring—albeit behind-the-scenes—role in the explosive entrance of smartphones. "Paul, as far back as I can remember, was saying that the wireless Internet was going to be greater than the wired Internet," says Peggy Johnson, a Qualcomm executive vice president who helped Jacobs convince now-defunct PDA maker Palm in 1999 to launch the pdQ, a predecessor to today's smartphone.

According to Johnson, Jacobs, who was in charge of the company's wavering handset division back in the pre-smartphone days, walked into a meeting one day holding a cheap Qualcomm-made cellphone taped to a PalmPilot. "That's what I want to build," he told the team. "Not many people even texted at that point," says Steve Sprigg, senior vice president of engineering at Qualcomm and lead of the company's early smartphone initiative. "The biggest hurdle was somewhat of a mindset issue—convincing people that, in effect, you were holding a little computer in your hand."

Pushed by Jacobs, Qualcomm execs spent months wooing Palm's then-CEO, Donna Dubinsky, and top mobile operators, trying to convince them that consumers would want to use one device for making calls and sending email. The 6.2-inch pdQ finally launched to great fanfare. "Once you use the pdQ, you will not want to go back to using a standalone Palm unit," wrote one reviewer. The problem was that there was little else to do but email. So Jacobs created Brew, an open applications platform for CDMA-based phones. (Some handset manufactur-

Qualcomm's pdQ, a predecessor to the smartphone, clocked in at more than six inches long and 9.8 ounces.

programmed to sync with the user's smartphone. The watch's face tells you when you have incoming calls and messages, for example. "I gave one to Shaq," Jacobs says during a stroll on Qualcomm's campus. Jacobs co-owns the Sacramento Kings with the former Los Angeles Lakers center Shaquille O'Neal. Jacobs also is a funder of La Jolla Playhouse and a big donor to the University of California at Berkeley. In a later conversation Jacobs expressed no angst about having to relinquish the CEO role earlier than expected. (Having a net worth of more than $400 million perhaps helps cushion the blow.) "The fact that Steve is taking over as CEO is a great outcome for us," he says. "I really want to focus on things I'm passionate about."

A decade ago *Fortune* ran a story titled "Heads We Win, Tails We Win," about telecom's transition from narrowband networks to 3G broadband networks. It turns out that all 3G systems, regardless of whether they started out as CDMA, rely on Qualcomm patents, and therefore Qualcomm has been entitled to a toll.

ers still use the operating system for "feature phones"—lower-price devices that don't have as much computing capability as smartphones.)

Jacobs is clearly proud of Qualcomm's role in promoting mobile computing, but he's the first to acknowledge that others are better at app stores and phone manufacturing. "I give Apple a lot of credit for exploring the consciousness of what a phone can be," he says. "And obviously Google getting into the space with Android was very good for us too."

While the barriers to entry in much of technology are crumbling, the chip business has remained relatively protected, largely because of its complexity (it's hard for a design-school dropout to launch the next Intel) and production costs. But the Internet of Things has the potential to change that. The extremely low-power chipsets for low-tech devices like refrigerators and espresso machines could open doors for new entrants to the chipmaking business that embrace the same "fabless" model, in which semiconductor companies farm out silicon manufacturing to mostly Asian factories. It is a model that has worked well for Qualcomm. Meanwhile Intel, which missed the shift to mobile computing, to the dismay of investors (in the past decade its stock has fallen 20%; Qualcomm shares are up 185%), is determined not to miss the Internet of Things movement. Under new CEO Brian Krzanich, Intel also is pursuing a new family of chips especially suited for "wearables" and other devices.

Jacobs insists that Qualcomm's move into new devices isn't a defensive step but a complement to its existing mobile-computing business, where it enjoys a commanding technology lead. (Qualcomm is on its fourth generation of chips for so-called LTE broadband networks. Rivals Intel, Nvidia, MediaTek, and Broadcom are producing their first generation of LTE processors.) The Toq watch is

Incoming CEO Mollenkopf believes a similar opportunity applies to the Internet of Things. "Our ambitions are to really be much more pervasive, not only in the phone space but in whatever replaces the PC, whatever happens in the home, in the car," he says. "But we also know that those things will be running some form of smartphone ecosystem, and it's going to be connected all the time, and it's very likely going to be through some sort of Qualcomm technology."

And so just as Apple took the smartphone further than Qualcomm ever could with the pdQ, other companies will build the software, apps, watches, and, yes, even the butt sensors that will power the Internet of Things. And that's just fine with Qualcomm. Put another way: Heads we win, tails we win. ■

FEEDBACK *michal_lev-ram@fortune.com*

PHOTOGRAPH BY **JOE TORENO**

WHERE GOOGLE VENTURES IS PINNING ITS HOPES

THE SEARCH GIANT'S VENTURE CAPITAL UNIT, NO LONGER A SILICON VALLEY PUNCH LINE, IS SHAKING UP THE BUSINESS. **BY MIGUEL HELFT**

The search for a better way to fight cancer is unfolding quietly against the floor-to-ceiling window of a conference room in a San Francisco office building where three young men are scrutinizing a jumble of Post-it Notes. Each yellow stickie is etched with meticulously drawn boxes and text in tiny black print. After a few minutes of contemplation, the men start placing blue-dot stickers—one here, one there—atop the notes. Each dot represents a vote in favor of a particular layout or wording, and each helps the trio converge on a new prototype for the online app of a company called Foundation Medicine. The goal: to make it easier for the doctors who use the app to record findings on new drug therapies. Foundation, a fast-growing company based in Cambridge, Mass., offers a diagnostic test that uses DNA sequencing to help doctors decide which

MODEL CREATED BY **MEGAN CAPONETTO**
PHOTOGRAPHS BY **SAM KAPLAN**

drugs to use to fight a specific tumor. After a September IPO, it is now worth more than $600 million. For this two-day "design sprint" to make its app easier to use, Foundation came to Google Ventures.

Google is not searching for better cancer therapies, at least not yet. Google Ventures, the search giant's venture capital unit, is helping Foundation because the life sciences company is one of its marquee investments. The venture group has a dedicated team of designers that huddles in intense sessions with portfolio companies to help them revamp websites, build new mobile apps, and fine-tune hardware products. "They really helped transform our website," says James Freeman, the CEO of Blue Bottle Coffee, which is also backed by Google Ventures.

Five years after its founding amid snickers and skepticism, Google Ventures has emerged as one of the hottest venture firms in Silicon Valley. It's sought out by entrepreneurs and, as a co-investor, by the Valley's marquee firms. In 2013 alone, three of its portfolio companies have gone public, and six were acquired.

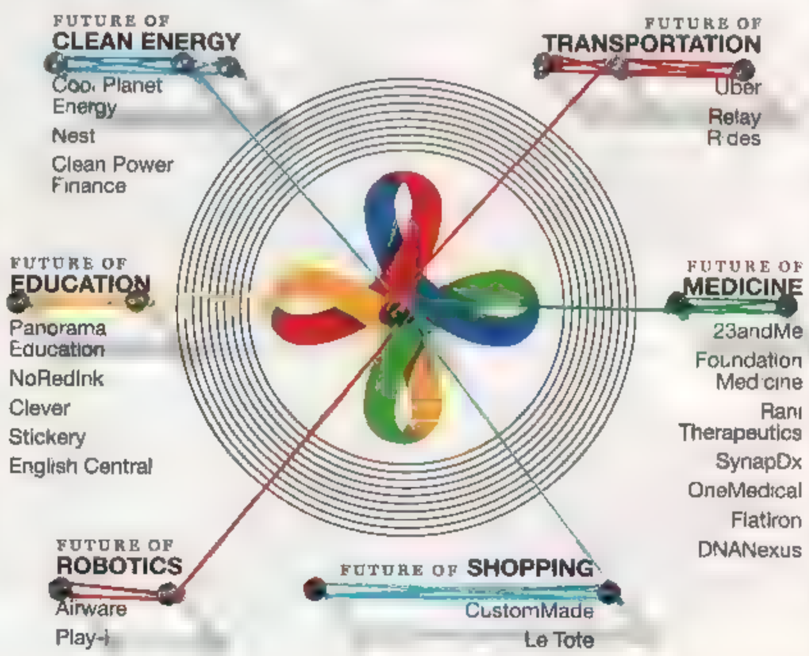
Its range of investments is surprisingly broad. You'd expect Google Ventures to bet on business software, mobile apps, and gadgets like smart thermostat company Nest, which it has. But Foundation and SynapDx, which is developing a blood test for early detection of autism? Or Cool Energy Systems, which aims to produce fuels based on plant photosynthesis in a process that removes carbon from the atmosphere? It has also made bets in education, finance, and robotics companies that have nothing to do with search or Android. "Most of the world's innovation doesn't happen at Google," says David Drummond, Google's senior vice president of corporate development, who oversees Google Ventures. "We have the capability to use our money, our time, our effort, our expertise, our brain power, and the Google brand to help build great companies, that's a worthwhile thing to do."

As at Google itself, some Ventures bets fall in the "moon shot" category, while others are more modest in scope. Collectively, they say a lot about where Google sees an opportunity to bring disruptive innovation to create a different future—one where medicine is more personalized; where the Internet broadens access to financial, educational, and clean energy resources; and where children can begin to learn computer science concepts from toy robots.

Staffed by some 60 employees, most of them ex-Googlers, Google Ventures has shaken up the venture business in myriad ways. With its dollars backing more than 220 companies to date, the firm has become one of the Valley's most prolific investors. It was the first major venture firm to use data scientists to help vet investments by analyzing scores of variables to detect what's likely to work based on what has worked before. As it grew from two general partners to 11, its investments have ranged from "seed" bets of a few tens of thousands to a $258 million investment in Uber earlier this year. Google Ventures contributes more than money. In addition to providing design services, it hosts workshops where founders and employees of portfolio companies hone their product management or operational skills. It helps with marketing,

PLACING BETS

GOOGLE VENTURES IS INVESTING $300 MILLION ANNUALLY IN STARTUPS THAT INCLUDE THE FOLLOWING.



recruiting, and engineering, often tapping Google's vast resources.

Like other venture firms, Google Ventures does not disclose its returns, but its approach appears to be paying off. Google, which is the sole investor in the firm, allotted $100 million to Google Ventures in its first year, 2009. It has since upped its investment to $300 million annually, a testament to Google's satisfaction with the results. The group now has more than $1.2 billion under management. More than 20 of its companies have gone public or been sold so far. One of them, Climate Corp., which uses big data to make highly localized weather predictions, fetched about $1 billion from Monsanto this year. And in a business where failures are common, only a handful of its portfolio companies have been shuttered. A top Google executive familiar with Google Ventures' returns recently confirmed that they are far above the industry's mean. "When we started, I got literally laughed at by some venture capitalists on Sand Hill Road," says Bill Maris, the founder and managing partner of Google Ventures. "Google didn't have a reputation for being a good investor or a smart investor in startups."

Google Ventures' emergence as one of the top financiers of startups may be a first for a corporate venture fund. While tech companies have long backed startups, their venture arms have a history of subpar returns. That's in part because they are often hamstrung in investment decisions by an imperative to deliver strategic value to their parent company. Maris argued persuasively that to compete effectively, Google Ventures, like standalone venture firms, had to be measured solely by its financial returns. Google established Ventures as a fully independent unit whose investment decisions don't have to be cleared with Google and where virtually every employee shares in the returns of the fund. If some investments help Google in strategic ways, so much the better, but that is not a requirement. Indeed, Google Ventures has sold companies to Google rivals like Dropbox, Facebook, Twitter, and Yahoo.

MARIS, 38, is a graduate of Middlebury College with a background in life sciences who founded an early web hosting company. As a biotech analyst, he once worked with Anne Wojcicki, the CEO of 23andMe, who recently separated from her husband, Google co-founder Sergey Brin. Maris has the ear of Google's top brass. He recently hatched the idea for Calico, the secretive anti-aging startup launched by Google and headed by Art Levinson, the chairman of Genentech and Apple.

On a recent day, Maris ambles into a crowded conference room looking a bit haggard. It's the morning after the Google Ventures holiday party, and the night before that Maris was up late as well—celebrating his engagement to his girlfriend. About three dozen people, none of them looking past 40, gather around a large conference room table, and a few more join via video conference from Google Ventures offices in Boston and New York for the group's weekly meeting. Maris and the others get updates on the design sessions, on a CEO summit for portfolio companies, and on briefings with *Fortune* 500 companies that Google Ventures hosted for some of its startups. In classic Google fashion, everything—down to the number of days it takes the group to respond to startups seeking funding—is quantified.

Despite all the Google trappings, Maris has helped to create a startup culture at Google Ventures. It's an essential ingredient, because without it, he wouldn't have been able to amass the talented group. Many of the general partners, as well as some of the designers and engineers, are entrepreneurs who sold companies to Google and might have decamped for greener pastures. They include Rich Miner, co-founder of Android; Kevin Rose, founder of Digg and Milk; and Joe Kraus, co-founder of Excite and JotSpot. "A lot of our team has been built by people who have built amazing companies," says Miner, who heads the Boston office. "Ventures is a pretty good destination for people who have that profile."

As it searches for industries to disrupt, Google Ventures is even willing to look at its own. Earlier this year it led a $28 million financing round into AngelList, often described as a Craigslist-like marketplace that matches entrepreneurs and angel investors. AngelList introduced a new funding model called syndicates, in which no-name angels pool their dollars with those of investors with an established track record. The model essentially allows better-known investors to build mini-funds for specific deals—which puts those investors in direct competition with Google Ventures, especially over seed-stage deals, which account for about half of its investments. "People called me and said, 'Are you crazy? You're investing in something that might put us out of business,'" says Wesley Chan, the Google Ventures partner who led the investment in AngelList. "I'd rather be on the right side of the disruption." It's clear that Google Ventures has inherited its parent's DNA. ■

A FUTURIST KNOWS

Robert Downey Jr. has become one of the most powerful players in Hollywood. But the 48-year-old actor admits he's not much of a networker. "I think about people, and I have a conversation with them in my head," he says. "But I tend to not reach out." In an interview about his career and the future of the movie industry, the *Iron Man* and *Sherlock Holmes* actor tells *Fortune* about the real-life discussions (Elon Musk!) that have influenced his thinking about technology, business, and entertainment.

[redacted]

By STEPHANIE N. MEHTA   *Photograph by* NIGEL PARRY

Q. This isn't the first time your image has been on the cover of a business magazine. Tony Stark's face has graced the cover of a few news titles too.

A. Yes! I wanted to close the circle.

Q. Elon Musk has been compared to Tony Stark, and parts of *Iron Man 2* were filmed at a SpaceX facility. Did you ever meet?

A. The genesis of that goes back to preproduction for *Iron Man I*, when SpaceX was in a smaller facility and Elon Musk was not a household name. As part of my research, I wanted to interview two people: John Underkoffler [the chief scientist at computer interface company Oblong] and Elon. I was looking to Underkoffler for straight technology [advice]. You remember in *Minority Report*, the character is wearing those gloves and moving the screens around? He and his company built that into a reality, so I was taking some cues from him: If Tony had designed his own software and his own programs and the machinery to operate them, what sort of language would he design to be able to manipulate his environment? And over the course of all these movies, that's been as much a part of Tony's character as anything else.

The spirit of Elon was really inspiring to me because Tony goes from doing one thing so well and so successfully and goes to do something that's a lot more risky and much more far reaching. And in the second *Iron Man*, Tony Stark has a conversation with Elon Musk about doing a project together.

Q. Were there any other business leaders or powerful people who inspired your performance?

A. There's a little bit of Howard Hughes in there. But in this character, in this potential franchise, I saw a huge business opportunity for myself. What was required of me was to put myself forward in a different light than I had been previously imagined, and to imagine being perceived as a bit more dashing, a bit more masculine. Essentially you aspire to a persona that puts you into a different light, which you can equate to more opportunity.

Q. Was that empowering for you?

A. It's one thing to participate in something that is a hit; it's another to replicate it in another realm. I was super-fortunate in the people I was surrounded with. When [director] Jon Favreau and [Marvel Studios president] Kevin Feige launched *Iron Man*, it was this brand-new thing that had just enough money to try to compete with what the other studios had been doing well for ages, and our skin was really in it, and if we failed, no one would be surprised. So we felt like college kids who think, Let's see if we can do this startup and make it fly. Pretty soon after that, I was lucky to work with my long-suffering wife [producer Susan Downey] and Guy Ritchie and Joel Silver in taking Sherlock Holmes and reinterpreting this original superhero, whose superpower is his brain, and that turned out very nicely too.

Q. In 2004 you released a contemporary music album titled *The Futurist*. What was the inspiration?

A. I had some time on my hands. I wasn't working much in my, ahem, chosen profession. An aspect of fortune is that when it's raining, then you gotta work inside the barn, you know?

I wrote a lyric "a futurist knows"—like, a futurist knows what's coming for us. Except I said, "a futurist nose," like the nose on your face. It is that kind of intuitive part of us that, when we're relaxed, can predict a felt sense of where our lives are going.

Q. Would you make another album?

A. Sure. The crossover, usually from cinema to music, is taken less favorably than perhaps it used to be. Yet there are some iconic people who are music entertainers appearing in film more regularly. I saw [Maroon 5 singer] Adam Levine in *Can a Song Save Your Life?* and I called him and befriended him because I realized that he's one of those people who can make that transition.

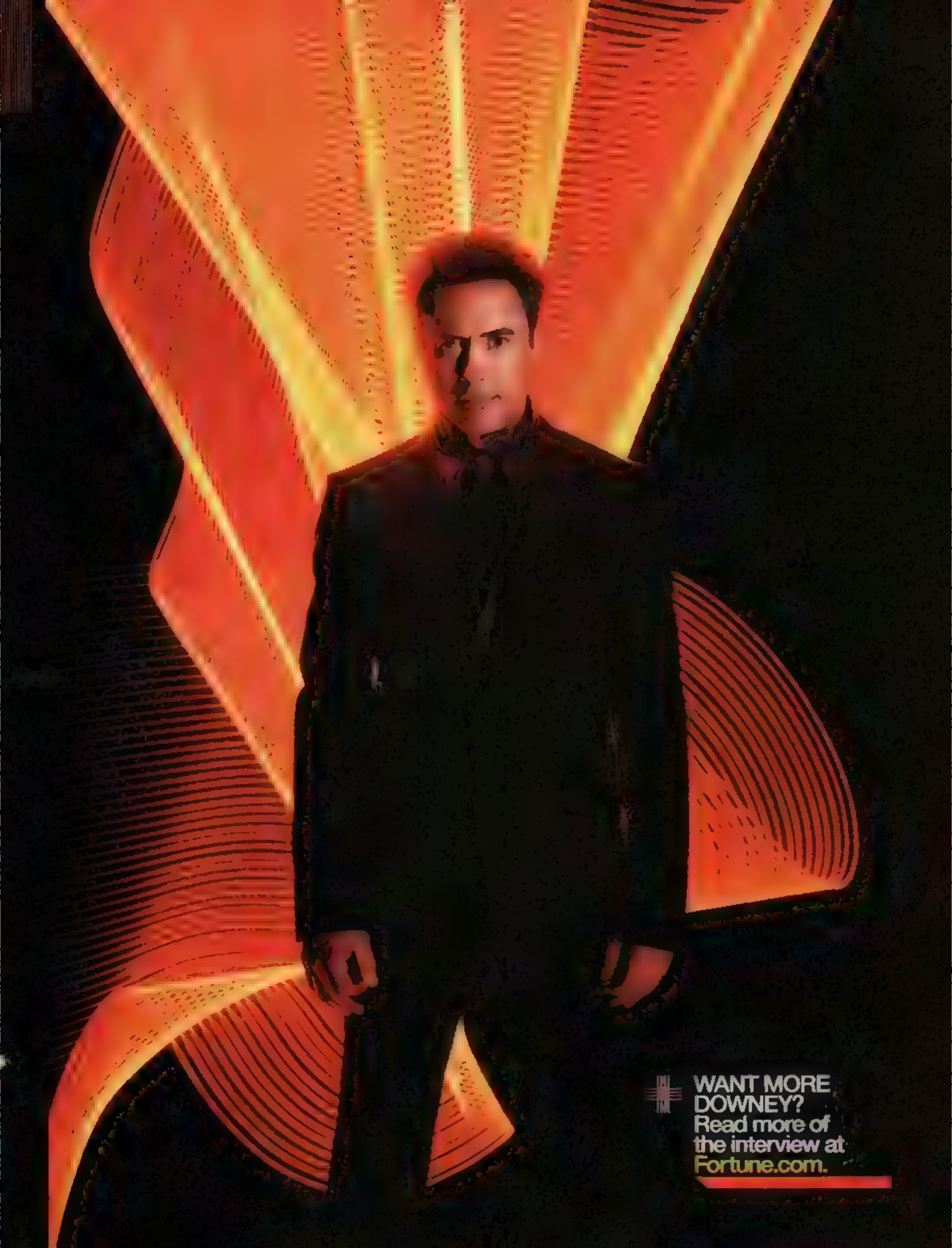
Q. You've worked in film as an actor for almost three decades, and now you're producing movies. How has the industry changed, and where is it going?

A. It's changed for me in that I feel I'm part of the furniture, and the thing about being someone no longer on the outside looking in is that all those projections become kind of null and void. I don't know that anyone can accurately say where any industry is going at any time. If someone had said 10 years ago that Matthew McConaughey would be the most interesting actor of 2013 or that someone like me would be at the top of the heap for box-office genre movies—I think neither he nor I would have believed it.

Q. Back to Elon Musk. Are you an investor in Tesla?

A. The funny thing is, I didn't really have the money to invest at the point at which I would have gotten in on the ground floor. ■

PRODUCTION DESIGN BY PETER BARGAGLIANO; STYLING BY JULIE WALDORF; GROOMING BY DAVY NEWKIRK AT TRACEY MATTINGLY. BLAZER, SHIRT, TIE, AND PANTS FROM H. LORENZO, SUNSET PLAZA, LOS ANGELES


WANT MORE DOWNEY?
Read more of the interview at Fortune.com.

COUNTDOWN TO THE

The ephemeral-photo-sharing app is having a moment. Can it figure out a way

By **JESSI HEMPEL** *and* **ADAM LASHINSKY**

SNAPCHAT REVOLUTION

to make money before the cl

THERE ARE MANY reasons for the business establishment to ignore—or collectively roll its eyes at—Snapchat.

For starters, fans of the disappearing-photo-sending service are mainly teens and other so-called digital natives, a fickle (translation: attention-deficient) audience that jumps from one digital confection to the next, bolting the minute a fave app goes mainstream. Then there are the founders of Snapchat—CEO Evan Spiegel is 23, Bobby Murphy, the chief technical officer, is 25.

Snapchat's Spiegel (left) and Murphy, photographed in Venice, Calif

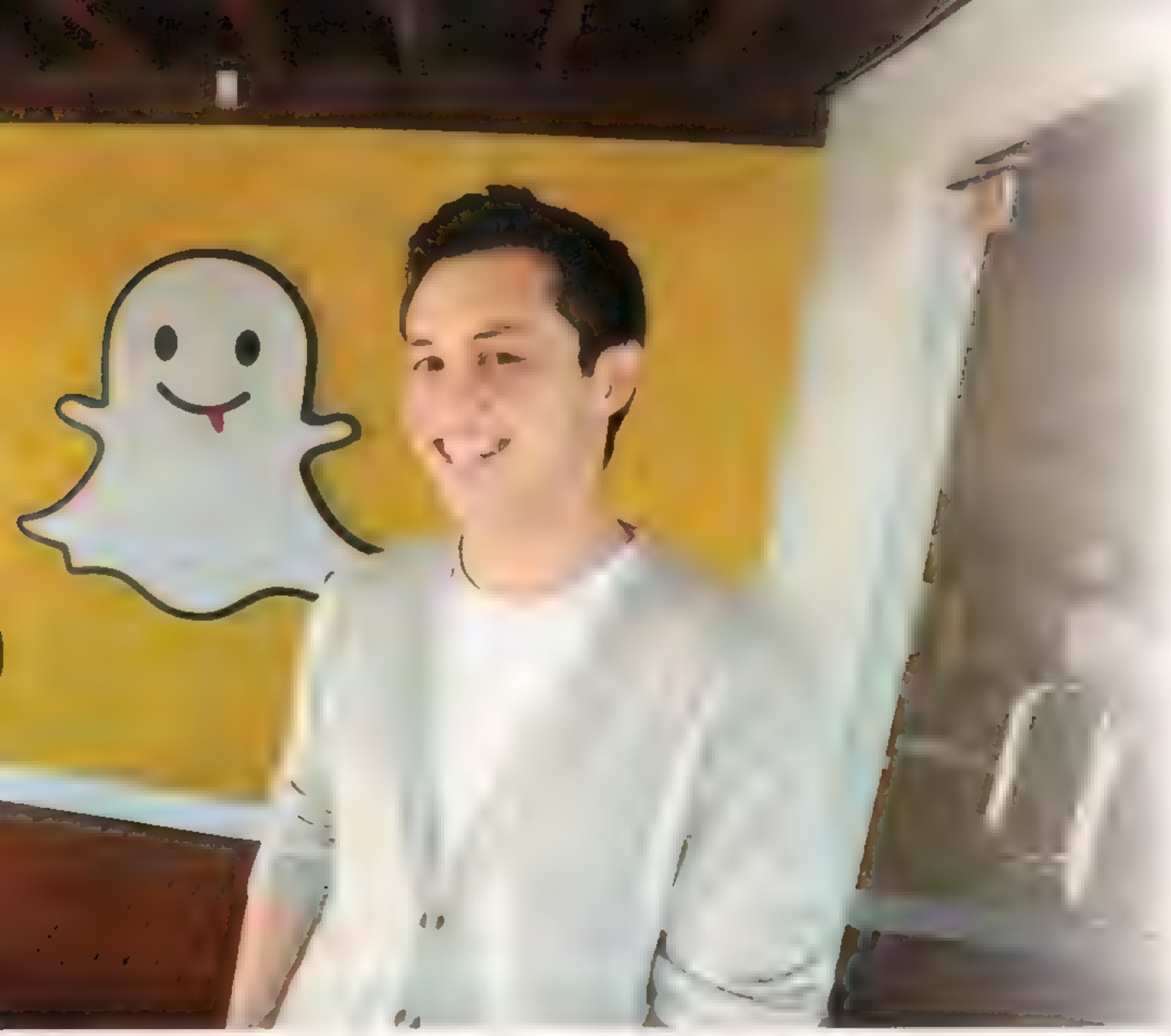
They're the kind of superconfident millennials who drive executives crazy because they don't know what they don't know. To wit: These kids turned down a multibillion-dollar acquisition offer from Facebook, even though they don't have a cent of reported revenue. And just what the heck is a "disappearing-photo-sending service" anyway?

But it would be a mistake to dismiss the Snapchat juggernaut. Far from being a fad, the service has grown in just two years from zero to tens of millions of devotees, who send as many as 400 million photos a day—and that number is growing. Investors have taken notice and poured $123 million into Snapchat, valuing the revenue-less company at an eye-popping $2 billion.

Why are investors and other grownups so into Snapchat? They see a company that isn't merely improving the photo-sharing craze established by Instagram (acquired by Facebook in April 2012 for $1 billion) but creating an entirely new form of communication. Its signature feature allows users to share photos and videos that disappear forever after just a few seconds. (The sender chooses the expiration time, up to 10 seconds, using a clever timer in the Snapchat app.) Just as email revolutionized the way people "talk" to each other at work and Twitter is altering the way people broadcast information, Snapchat has in a very short time become the lingua franca of a younger generation.

Snapchat's ascent has caught its rivals off-guard—Facebook's buyout offer (after it tried to copy it) suggests that the rest of the social media ecosystem covets what Snapchat has created. Google and Yahoo both are investing heavily in building out features that encourage users to interact with photos. Meanwhile, around the world, especially in China, similar "short burst" communication apps, such as Whatsapp, WeChat, Kik, MessageMe, KakaoTalk, and Line, are on the rise. They allow users to replicate the texting experience without the fees, a trend the phone companies must be eyeing nervously.

Snapchat's future success is by no means assured. The ephemeral nature of transactions on the platform, the very thing that makes Snapchat so tantalizing to its audience, is a turnoff to marketers, who are looking for ways to monitor and track customers' every move. Nevertheless, the Snapchat story, while still in its early chapters, offers important insights into the speed with which mobile services can proliferate. Inexperience and bravado, once traits that business executives sought to downplay (remember the "adult supervision" that investors used to impose on young founders?), are now assets, though financiers hedge their bets by providing founders with plenty of mentoring and support. If nothing else, Snapchat's story serves as a reminder that innovations are always around the corner, and no company is immune to disruption—not even Snapchat itself.



IN THE SPRING OF 2011, Evan Spiegel and Reggie Brown, both juniors at Stanford University, hatched an idea to build a mobile-phone app. It featured a unique approach: the disappearing photo. Spiegel and Brown's own classmates dismissed the concept. When Spiegel presented it to his product-design class, his peers shot it down. Still, Spiegel and Brown believed they were on to something. They recruited Bobby Murphy, a 2010 graduate and a fellow member of the Kappa Sigma fraternity, with whom Spiegel had collaborated on an earlier, failed startup. (Called Future Freshman, a website for high schoolers, it never graduated.)

That summer the trio set to work at the home of Spiegel's father, John, a prominent corporate litigator in Los Angeles. John Spiegel's $3.3 million home in the swank Pacific Palisades neighborhood defied the startup narrative: There were no late nights spent wolfing down cheap takeout burritos à la Silicon Valley. These founders had access to a personal chef and a pool, and they indulged in L.A.'s nightlife scene. By mid-July they'd launched an app with a yellow "Ghostface Chillah" logo (an homage to the rapper Ghostface Killah). They originally called the service Picaboo—a mashup of "picture" and "peekaboo"—meant to convey the signature functionality of their idea: Now you see it, now you don't.

The friends moved quickly to turn the idea into a company. After just three months of coding, they launched a prototype in Apple's App Store—and had an internal dispute so conten-

tious it will surely require large sums of money and a gaggle of lawyers to resolve. After Spiegel and Murphy quarreled with Brown over the order of their names listed on Snapchat's patent application, the two set the proverbial timer on Brown's involvement with Snapchat and allegedly pushed him out of the company. Brown, now an MBA student at Duke University, is suing Snapchat, seeking damages plus a third of the company's equity—suddenly a meaningful demand.

Meanwhile, in September 2011, Spiegel and Murphy renamed the app Snapchat, and it immediately began to catch on. Its first users were Orange County high school students who'd learned of it from one of Spiegel's cousins. The students had been equipped with iPads, but Facebook was blocked. (Hey, it was school!) Snapchat was a great workaround. Within two months it had 3,000 users. Then Apple introduced a reverse button for the camera on its phone, designed to make selfies easy. Growth took off.

In many ways the timing was perfect for Snapchat's explosion. The app caught the attention of a generation of kids smartening up to the dangerous potential of social media. The web had become a scary place, where every faux pas became permanent. Anthony Weiner had gotten caught with his pants down. Literally. College administrators began reviewing prospective students' social media profiles before admitting them. New graduates learned that potential employers could view the tangible evidence of their youthful indiscretions. A racy communication tool that left no fingerprints suddenly looked attractive.

By May 2012, Spiegel had taken a leave from his studies, and he and Murphy were running low on cash. (The pair had previously self-financed, relying on Murphy's salary as an engineer with Revel Systems, an iPad point-of-sale company, to pay the server bills. In April 2012, Murphy had quit his job.) Meanwhile, venture capitalists were beginning to notice the app's impressive growth. Lightspeed Venture Partners' Jeremy Liew heard about it through a colleague, who had noticed the app on his teenage daughter's phone. He tracked Spiegel down—via a Facebook message—to make the first investment. Spiegel and Murphy used the $485,000 from Lightspeed to hire engineers and pay for computing power. Later in the year Silicon Valley heavyweights Benchmark Capital and SV Angel joined Lightspeed to invest another $12.5 million.

While the service didn't initially attract people over 25 years old, the sheer speed of its growth caused a small subset of power brokers to pay attention. Sony Pictures CEO Michael Lynton's kids attended school at Crossroads, the same posh liberal prep school Spiegel had attended. Lynton's wife emailed Spiegel to come to dinner, and soon afterward, in June 2013, the studio head joined the company's board. Around the same time, Snapchat raised $60 million in a funding round led by IVP that valued the company at $800 million. As it turns out, that was nothing. Less than six months later hedge fund Coatue Management invested $50 million at a valuation of $2 billion.

EARLY ON, THE APP caught the attention of Mark Zuckerberg, Facebook's CEO. In December 2012 he flew to Southern California to meet with Spiegel and Murphy. Shortly after that, Facebook began experimenting with

NAME OF COMPANY	OFFICIAL DATE OF FOUNDING	NUMBER OF MONTHS TO 25 MILLION USERS	WHEN IT BEGAN TO MONETIZE	RECENT VALUATION
FACEBOOK	FEBRUARY 2004	[illegible]	APRIL 2004	[illegible]
TWITTER	MARCH 2006	[illegible]	APRIL 2010	$31 billion
TUMBLR	FEBRUARY 2007	[illegible]	MAY 2012	$1.1 billion (acquired by Yahoo in June 2013)
INSTAGRAM	OCTOBER 2010	[illegible]	NOVEMBER 2013	$1 billion (acquired by Facebook in August 2013)
PINTEREST	MARCH 2010	[illegible]	[illegible]	$3.8 billion
SNAPCHAT	SEPTEMBER 2011	25	N.A.	$2 billion

a copycat feature called "Poke," named for a popular game-like feature from Facebook's earliest days. It was a move that Spiegel referred to at a fall tech industry conference as "the greatest Christmas present we ever got" because of the attention Facebook's assault focused on Snapchat. Poke failed.

Outwardly Zuckerberg maintained that as social media matured, kids were doing more of it, so they could embrace lots of services without abandoning Facebook. "People assume that because there are different experiences, somehow it's a zero-sum game," he told *Fortune* in April. "But it's actually a rapidly expanding market. People share more and more every year, and they want lots of different experiences."

Despite the brave face Zuckerberg put on, Facebook was already concerned that Snapchat could steal some of its thunder with teenagers. Last fall it tried to buy Snapchat, offering to pay more than $3 billion, according to multiple sources close to both companies. The spurned offer was the first in a chain of Snapchat-related dings for Facebook. On Oct. 30, in an earnings call with investors, Facebook disclosed that daily active use among teens had fallen off. Then in early December Snapchat named a new chief operating officer: Emily White, the 35-year-old Facebook executive who had been charged with making that company's Instagram unit profitable.

IN OCTOBER, SNAPCHAT INTROduced "stories," a new feature in which photos don't immediately disappear. Users and their friends can build "chains" of photos, basically a digital photo album, that are available to all their contacts for 24 hours. (There's also an option to share stories with all Snapchat users.) The community can view the album an unlimited number of times until it expires. Stories represents an evolution for Snapchat, offering customers slightly less privacy and urgency than the original product promised, while edging toward the kind of product marketers find appealing. Stories could be tweaked to include more contributors (including corporations) and to allow images to be accessible for longer periods.

Snapchat says the new feature was under development for more than a year, and other moves suggest that the company has been getting ready for primetime. This fall it gave up the powder-blue beach bungalow it was using as headquarters for a much larger, less flashy storefront hidden in a Venice alley. There's no signage anywhere; a tiny gray ghost painted on the door is the only indication that 30 or more employees are coding within. Earlier in the year it hired Philippe Browning, a midlevel mobile-advertising executive from CBS Interactive. His title—vice president of monetization—suggests a seriousness of purpose for Snapchat. It also has begun approaching well-known online marketers to encourage them to consider using Snapchat.

So far the response has been tepid. Only a few marketers are running tests on Snapchat. Taco Bell, for example, used Snapchat in May to distribute photos of its new Beefy Crunch Burrito, and it publicized its photo campaign on Twitter. The restaurant chain is now experimenting with stories. Some potential partners maintain that the service remains too new to be on marketers' radar screens. "I'm on the boards of Chegg, Groupon, and Caesars," says Jeff Housenbold, CEO of the market-leading photo site Shutterfly. "Snapchat is not entering into the marketing conversation at all. In contrast, Pinterest is entering the discussion all the time. But not Snapchat."

Snapchat must persuade marketers that the benefits of reaching its coveted youth audience outweigh the relative anonymity of that audience. "In an era where big data rules, how does Snapchat, which collects no data on the user, sell itself to marketers?" asks Arra Yerganian, chief marketing officer for University of Phoenix, a big online advertiser.

Marketing isn't the only way Snapchat might make money, of course. Game publishers have used messaging platforms in Asia, including Chinese online giant Tencent's WeChat, to publicize its games and allow users to share their experiences. Snapchat would work well that way. After building up a bigger user base, Snapchat also could experiment with premium services, such as storing photos.

With its $100 million-plus in venture money and a new operating chief, Snapchat certainly has the resources to try new products and find ways to court companies that will pay for access to the Snapchat universe. But given the speed of innovation going on in China and Silicon Valley (and now Los Angeles), what Snapchat does not have is unlimited time. And a company with a timer as part of its app is sure to realize that. ■

REPORTER ASSOCIATES: *Marty Jones and Chanelle Bessette*

ANOTHER SNOOPING SCANDAL WILL BREAK

Last year the NSA leaks were the most followed news story—more Americans tracked our government's efforts to track us than watched or read about the Boston bombing. According to Pew, 70% of us believe the government uses information gleaned from our telephone and Internet use for purposes other than investigating terrorism. Are more snooping revelations on the way? Hmm. *The Guardian* says it has published perhaps 1% of the files given to it by Edward Snowden.
Odds: 36%

25%

MIS-TAPERING WILL TRIGGER A CRISIS

How safe is the financial system? Well, here's one scenario we could (but with any luck won't) see in 2014: The Federal Reserve mishandles the reduction in its monthly bond buying—the much-awaited "tapering"—causing interest rates to spike (perhaps as much as three percentage points in a month). If that happens, expect the nation's five largest banks, which hold lots of bonds, to lose tens of billions of dollars. That alone wouldn't trigger a financial crisis. But you know what might? The blowup of a large credit hedge fund stuck with a bad, heavily leveraged bet? Yes, it rings all too familiar.
Odds: 19%

ELON MUSK WILL HAVE A CHANGE OF HEART

After an early 2014 white paper shows major challenges for the Hyperloop, Elon Musk lobbies his fellow billionaires to join him in investing in high-speed rail.
Odds: 10%

0%

Percent chances our predictions will come true in 2014

THE FORTUNE

What will get the talking heads talking in 2014—the big deals, the inescapable

Up through the 1960s, meteorologists forecast the weather by measuring the present state of the atmosphere and extrapolating forward. They'd throw some data into a computer simulation—wind direction, barometric pressure, moisture in the air, temperature—and out would come a prediction of the weather a week or two hence. Most often, it was wrong. As an MIT researcher named Edward Lorenz discovered, the tiniest errors in measuring the atmosphere soon doubled in magnitude, and doubled again, turning the best predictive modeling into a demonstration of chaos. The weather doesn't follow straight lines. Neither does business. Or the economy.

By
Ryan Bradley, Geoff Colvin, Catherine Dunn, Leigh Gallagher, Stephen Gandel, Miguel Helft, Jessi Hempel, Marty Jones, Adam Lashinsky, JP Mangalindan, Megan McCarthy, Tory Newmyer, Jennifer Reingold, Daniel Roberts, Alex Taylor, Shawn Tully, and Jen Wieczner

TWITTER WILL CLOSE BELOW ITS IPO PRICE

In the coming year the Blue Bird of Chattiness falls to earth—as do the valuations of other social-media giants. (For more, see the box "Tech's Smart Money Will Exit.") Odds: 56%

DEMOCRATS WILL HOLD THE SENATE

An improving economy—scratch this if there's a banking crisis (see left)—puts control of the Senate out of reach for the GOP. Republicans have to net six seats to retake the Senate in 2014, and they've got pickup opportunities in seven [illegible] that Mitt Romney carried in 2012. But to pull off the sweep, the party needs things to be going very badly next fall. Chances are, they won't be. Odds: 71%

75%

MARK HURD WILL RIDE AGAIN

Larry Ellison turns 70 in 2014, and he's riding high. His America's Cup team pulled off a miraculous defense in San Francisco Bay. His real estate projects (from Malibu, Fla., to Lanai, Hawaii) make him the most interesting landowner since Ted Turner. Yet Ellison's company, software maker Oracle, is stuck in neutral, losing ground to upstarts like Salesforce.com and Workday. It's a perfect time for Ellison to hand the CEO reins to his co-president, Mark Hurd, whose scandalous departure from HP three years ago is all but forgotten in the land of short-term memory, Silicon Valley. Odds: 81%

100%

[redacted]

CRYSTAL BALL

trends, the newsmakers? Our well-studied predictions for the year ahead.

Or technological innovation. All of which would suggest that trying to predict what's going to happen across a span of industries in 2014 is a fool's errand. We thought we'd try anyway. For our first foray into prophecy, however, we also tried to think nonlinearly—dancing past the obvious (when we could) and asking our expert sources to do the same. What follows is a look into the hive mind of *Fortune* as we ponder the coming year. For each prediction, we've given our best guess as to the probability, in percentage terms, that it will come true by Dec. 31. The only thing we're quite sure of? It's more fun than predicting the weather.

[redacted]

THE NEXT BUBBLES

Art

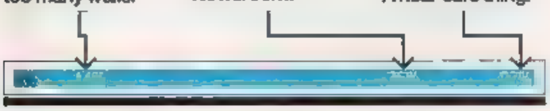
Plenty of air was pumped into the already tumescent market for fine art last year. First a painting (or one set of three) by Francis Bacon sold for $142.8 million, the most ever paid for a work at auction and a 165% spike in price from when the last Bacon triptych sold, in 2008. Then a dog sculpture by Jeff Koons fetched $58 million, the most ever paid for a work by a living artist. That this happened on the same night, in the same Christie's auction, could mean one of two things: rampant speculation portending the end of a bubble as everyone scrambles to sell, or just plain rampant speculation. **Odds that the art market collapses this year?** Only slight. Too many billionaires these days need to fill too many walls.

Student Loans

There is an estimated $150 billion in outstanding student loans weighing down most recent and not-so-recent college graduates. For millions of young Americans, it's a genuine problem. But is it a bubble? Not really—at least by the standards of history. Look back to 2006 and 2007, when banks traded nearly $135 billion worth of Sallie Mae's student-loan asset-backed securities (known as SLABS). Today many banks are out of the student-loan biz altogether, and just $1.1 billion in SLAB trading makes waves in the papers—barely a ripple compared with far frothier times. Still, count on many in the media (and pretend media) to call it that. **Below, odds that Aaron Sorkin will write it into the plot of *The Newsroom*.**

Conferences

First thing first: There is a conference named BubbleConf; it is for entrepreneurs, but more telling, it was born out of its founders' need to simply "organize a conference." The U.S. Bureau of Labor Statistics expects the convention and event industry, which already generates an estimated $80 billion a year, to expand by 44% over the next decade—*Fortune*, of course, has a few conferences of its own. But nothing captures the conference proliferation quite like the American Planning Association's 2014 gathering in Atlanta—which, literally, is a conference for planning more conferences. **What are the odds that Bravo will develop a reality show around the people at the conference of conferences?** A near-sure thing.



THE ARCTIC CIRCLE WILL BE A HOTSPOT

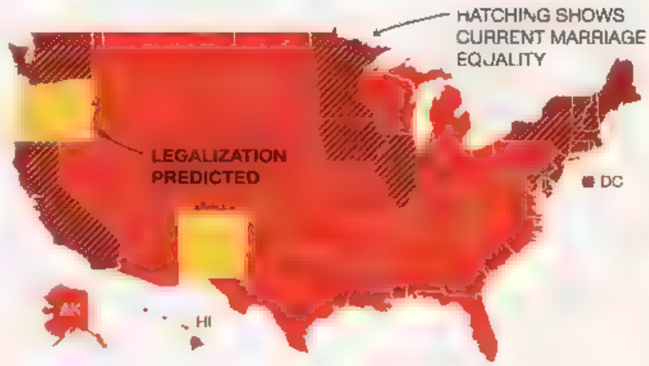
AN EIGHTH OF THE WORLD'S UNDISCOVERED OIL AND 30% OF ITS NATURAL-GAS RESERVES ARE LOCKED BENEATH IT. SIX NATIONS CLAIM SLICES OF THIS POLAR PIE. TWO OF THE BIGGEST COMPANIES IN THE WORLD, EXXON MOBIL AND ROYAL DUTCH SHELL, ARE SPENDING BILLIONS TO PROBE ITS SEABED. CHANCES THAT A GEOPOLITICAL SPARK WILL CATCH FIRE IN ONE OF THE MOST FRIGID SPOTS ON EARTH?

8%

Fuel-Cell Cars Will Hit the Show Room Floor

THE FIRST COMMERCIAL FUEL-CELL VEHICLE WILL BE LAUNCHED IN THE U.S. THIS SPRING BY HYUNDAI. A TUCSON COMPACT CROSSOVER POWERED BY HYDROGEN THAT EMITS ONLY WATER FROM ITS TAILPIPE. THE FUEL-CELL TUCSON HAS A RANGE OF 300 MILES, CAN BE REFUELED IN A MATTER OF MINUTES, AND WILL LEASE FOR $499 A MONTH—THOUGH AT FIRST ONLY IN SOUTHERN CALIFORNIA BECAUSE OF THE LIMITED HYDROGEN INFRASTRUCTURE NATIONWIDE. TOYOTA WILL BE NEXT (IN LATE 2014). HONDA WILL FOLLOW SUIT IN 2015. GENERAL MOTORS HAS RACKED UP 3 MILLION TEST MILES WITH A FLEET OF 119 CHEVROLET EQUINOX FUEL-CELL CROSSOVERS BUT HAS NO PLANS TO MARKET ONE. COUNT ON NEW CEO MARY BARRA TO FEEL THE HYDROGEN HEAT.

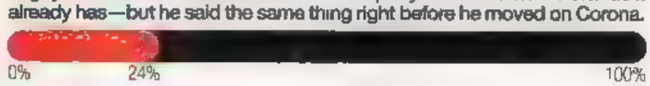
STATES THAT WILL LEGALIZE SAME-SEX MARRIAGE



States are busy rewriting the rules when it comes to same-sex marriage,

Anheuser-Busch InBev Will Buy Guinness

In 2013 the Belgium-based, Brazilian-managed, biggest beer company in the world bought up Grupo Modelo, adding Corona to its portfolio of globally recognized brews such as Budweiser, Becks, and Stella Artois. What next? Analysts won't go on record speculating, but, says one, "the big companies are so much bigger than the small ones that anything *not* owned by ABI, SAB, or Heineken is pretty much up for grabs." So why Guinness? It may be the most iconic brand of those *not* owned by one of the big three. Guinness's owner, Diageo, which focuses mostly on spirits, has said it wants to keep the popular stout. But if the price is right, expect Diageo to sell. ABI CEO Carlos Brito is famously cagey about M&A and insists that his company will focus on the brands it already has—but he said the same thing right before he moved on Corona.



PREVIOUS SPREAD: DAVID ARKY; OHIO: JOE SOHM / VISIONS OF AMERICA/ALAMY. MAP SOURCES: LAMBDA LEGAL DEFENSE & EDUCATION FUND; NATIONAL ORGANIZATION FOR THE REFORM OF MARIJUANA LAWS; BLOOMBERG BNA

THE NEXT BROOKLYNS...AND DETROITS

The American geography of prosperity has been driven by two big narratives in the past few years. On the one hand, there's Detroit, with its $18 billion in debt, pension mess, and population loss. On the other, there's Brooklyn, with its rocketing real estate prices, hip-luxe condos, and freshly foraged food stores. But what's next for this Tale of Two Cities muni-drama? Our bets for 2014's breakout and breakdown towns.

NEW BROOKLYNS

Cleveland. The city is in the midst of a downtown revival that has seen not one, not two, but three Williamsburg-esque neighborhoods emerge: Tremont, Ohio City, and Gordon Square.
63%

Louisville. A thriving indie music scene, food trucks galore, and a monthly flea market (that seems "like Etsy came to life," according to Yelp) now fill this blue dot in a red state.
91%

Detroit. College-educated settlers under 35 are drawn to sub-$1,000 rents and the chance to be pioneers. A telltale sign of change: NO HIPSTER graffiti tags showing up around town.
39%

RUNNERS-UP
Chattanooga; Newark

NEW DETROITS

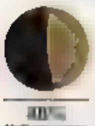
Woonsocket, R.I. The onetime prominent textile hub fell victim to deindustrialization, then the recession, then severe cuts from state aid. Unemployment is now 10%.
38%

Puerto Rico. The public debt of this commonwealth is $70 billion, unemployment (at 14.7%) is higher than in any U.S. state, and labor force participation (at 41%) is the lowest.
54%

Fresno. The central California agricultural hub has little cash on hand, an ongoing gang issue, and a five-year foreclosure rate of 94.5 per 1,000 households, according to Metrostudy.
86%

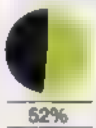
RUNNERS-UP
Atlantic City; Gary, Ind.

The Federal Minimum Wage Will Rise 39%



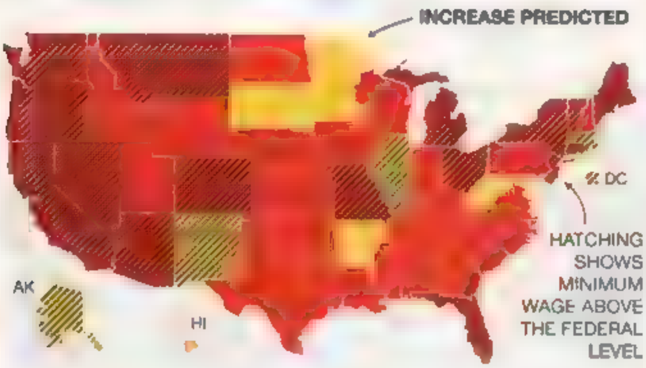
Two decades after the Living Wage movement began in Baltimore (when local homeless shelters began filling with residents who had full-time jobs), popular support for a hefty increase in the minimum wage resurges. States are already taking action (see below). Here, the odds the federal minimum wage is increased to $10.10/hour, from the current $7.25.

Rand Paul Will Support Ending Ban on Pot

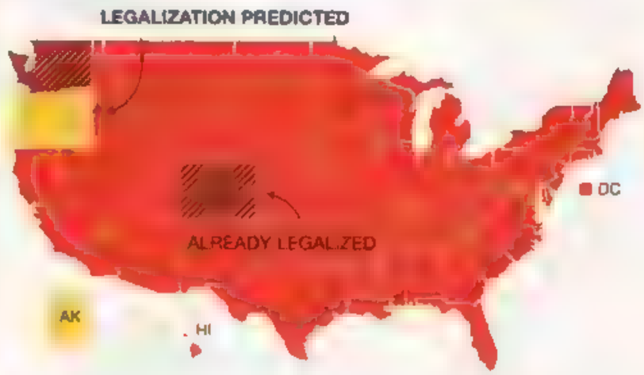

52%

The Kentucky senator has already pushed to legalize industrial hemp as a jobs boon back home. In 2014, Paul goes much further, saying the drug should be taxed and regulated. It's a dicey proposition for the likely 2016 presidential aspirant. Evangelicals in early Republican primary states like Iowa won't like the stance, but millennial voters strongly support legalization.

STATES THAT WILL RAISE THE MINIMUM WAGE



STATES THAT WILL LEGALIZE MARIJUANA



raising the minimum wage, and marijuana use. Here are our predictions on where the laws of the land will change by the end of 2014.

Google Will Develop Killer App for the Soul

Google releases a "quantified self" app for Glass that tracks respiration, eye movement, and other data to determine your emotional well-being. With a Google+ plug-in, you can share results with your friends—so they can send supportive messages on tough days.

TECH'S SMART MONEY WILL EXIT

Anyone who has seen Silicon Valley's boom-bust cycles before knows there's a bust on the way. When pre-revenue Snapchat (see our feature story in this issue) turns down a multibillion-dollar buyout offer from Facebook, when Twitter and LinkedIn trade for many multiples of their relatively puny sales, when Salesforce.com mimics Oracle by closing down San Francisco streets for its annual user conference, you know the peak isn't far away. This is when savvy investors run in the opposite direction.

BMW WILL OUTCOOL TESLA

While Tesla struggles with battery fires in the Model S and the delayed launch of the Model X SUV, BMW will introduce a pair of vehicles that knock the socks off the stock-options set—the all-electric i3, a practical sedan with BMW panache, and the exotic i8, a nearly $140,000 plug-in hybrid with racecar performance.

50 PERCENT

75

AT&T Will Merge With Vodafone

Rumors have been swirling for a decade about a possible merger between American telecom giant AT&T and its British counterpart Vodafone. But while a 2004 deal fell apart, speculation intensified again this past September after Vodafone agreed to sell its 45% stake in Verizon back to that company. (Many view that as a needed step before Vodafone can pursue a deal with AT&T, the second-largest telecom firm in the U.S. after Verizon.) AT&T has expressed interest in European acquisitions in 2014 and is quietly eyeing Vodafone, according to news reports, though neither company will confirm it. Further consolidation in the telecom industry—as with reports that Sprint is pursuing T-Mobile—could make a deal more likely.

INVESTOR ACTIVISM WILL INTENSIFY

Activist investors in 2013 stormed the gates of even the most valuable companies—Apple, Procter & Gamble, Microsoft—and they're likely to grow still bolder in 2014. That's because activists far outperformed the S&P (earning 25%, vs. 19% through 2013's first three quarters, says Hedge Fund Research), attracting more billions to wield. But after so much activity, who's left to go after? Consider four possibilities:

NELSON PELTZ WILL TAKE ON **WAL-MART**

Peltz likes moving in on famous consumer stocks (H.J. Heinz, Kraft Foods, PepsiCo) and wouldn't be intimidated by even the world's largest retailer. Wal-Mart's share price suggests lowered investor expectations, and Peltz might see an opening when Doug McMillon takes over as CEO in February.

BILL ACKMAN WILL TAKE ON **CATERPILLAR**

Ackman has drawn attention for investments that have failed (J.C. Penney, Target) or been controversial (Herbalife), but he's done well by shaking up big B2B outfits like Canadian Pacific Railway. Cat's stock, the Dow's best performer in 2010, has been among its weakest and most heavily shorted in 2013.

DAN LOEB WILL TAKE ON **CISCO**

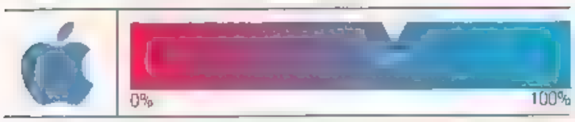
Loeb isn't afraid of technology; he famously rattled Yahoo's cage and made $1 billion. Cisco has been performing excellently, but the stock has lagged in large part because investors worry the good news can't last. CEO John Chambers has said he plans to step down in one to three years.

CARL ICAHN WILL TAKE ON **EXXON MOBIL**

Icahn is on a roll with energy companies. He got CVR Energy to break itself up and recently persuaded Transocean to pay a special dividend and cut costs. Yes, Warren Buffett recently invested in Exxon—but famed short-seller Jim Chanos is betting against it. The share price reflects shrinking profit expectations.

PELTZ: BEN HOFFMANN ACKMAN: NOAH BERTS - BLOOMBERG VIA GETTY IMAGES LOEB: LARRY BUSACCA GETTY IMAGES FOR THE NEW YORK TIMES ICAHN: HEIDI GUTMAN CNBC NBCU PHOTO BANK VIA GETTY IMAGES

Apple Will Shoot Another Blank



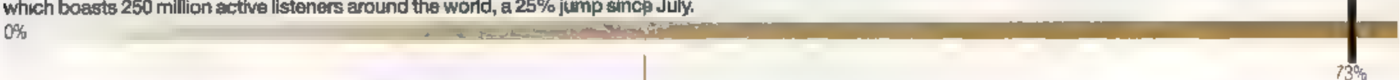
The iWorld expects—nay, demands—an iTV, an iWatch, an iSomething, dammit, from Apple this year. Don't bet on it. Nor will Apple's failure to deliver something amazing under Tim Cook reflect the CEO's inability to conjure the magic of his predecessor, Steve Jobs. Those who will claim this (reporters, investors, fanboys) forget that six years separated the release of the iPod and the iPhone. It has been only three years since Apple's last great hit, the iPad. Apple's next new thing will come... when Apple is good and ready.

OBAMACARE COST WILL EXPLODE

After months of hemming and hawing, the Obama administration admits that the long-term cost of the Affordable Care Act will be twice what was originally predicted. By this fall the Congressional Budget Office will double its estimates for the annualized cost of federal spending on Obamacare in 2023, from $134 billion to around $270 billion. The reasons for the jump? First, the program will fail to attract a sufficient number of young, healthy workers to sustain it on an actuarial basis—a concern raised by the American Academy of Actuaries. Second, companies in low-wage industries from mining to retail will flee the health care business. Many more than expected will drop their plans, pushing droves of workers into the Obamacare exchanges.

SOUND SHARING WILL BECOME AS POPULAR AS PH

Already, 11 hours of sound are uploaded per minute, and it's much more than music. As for who will be the YouTube of this movement, our Magic Eight Ball has little which boasts 250 million active listeners around the world, a 25% jump since July.



Whatever product Apple releases (or does not release), there's a 100% chance you'll have to buy a new cord.

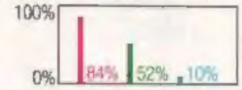
Freework Will Reign

In 2014 there's a very good chance most of us will work for tech companies for nothing. We'll log traffic accidents on Google-owned Waze, enter our sleep patterns on our Jawbone Ups, and tell OpenTable just how much we hated the swordfish at St. Vincent. We'll do it with the same fervor we reserve for our Candy Crush habit.

Same-Day Delivery Will Go Standard

Customers shouldn't expect their packages by drone anytime soon. But as Amazon, eBay, and others push ahead with faster delivery, $5-plus same-day service will become reality for most U.S. shoppers. To wit, eBay Now already approaches one-hour deliveries in five locales (Chicago, Dallas, New York City, San Francisco, and San Jose). Here, what will happen in 2014:

EBAY NOW EXPANDS TO 25 CITIES
AMAZON PARTNERS WITH UBER
WAL-MART HIRES OFF-DUTY CASHIERS TO DRIVE PURCHASES TO CUSTOMER DOORS



[redacted]

AMAZON.COM WILL BUY THE POST OFFICE

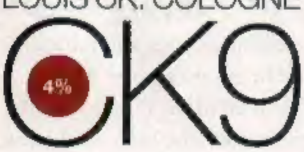
Seven straight years with a net loss. Sounds a lot like other startups Amazon has invested in. Except we're talking about a fiscal 2013 loss of $5 billion, and we're also talking about the U.S. Postal Service, which Amazon announces it will buy for, well, free. Unions are up in arms; drones rejoice. (No, this won't and can't happen in 2014. But the odds of the USPS getting privatized by 2020? Hey, not that small...)

JANET YELLEN WILL GET INTO A SHOUTING MATCH

The Federal Reserve's Open Market Committee has long been one of the most collegial institutions in policymaking, with disagreements couched in econo-speak and tucked away in old meeting minutes. Rare is the spat that breaks into the open. But in 2014 all that changes, as disputes over the pace of tapering play out in fiery speeches and news-media interviews.

0% 59% 100%

Future Celebrity Product Launch
LOUIS CK: COLOGNE



OTO SHARING

doubt: the audio platform SoundCloud,

McKESSON WILL BUY RITE AID

No. 14 on the *Fortune* 500 buys No. 113. The generic-drug industry has been quickly consolidating, and major distributor McKesson Corp. is pursuing new ventures. But while it went shopping in Europe, its American competitors called dibs on the top two U.S. pharmacy chains, striking purchasing deals with Walgreen and CVS. The odd men out, Rite Aid and McKesson, could become bedfellows, analysts say: "If I'm Rite Aid, seeing two of my biggest competitors partnering up for better deals on generics, I might be motivated to try and keep up," says Tom Gallucci of FBR Capital Markets. McKesson has denied interest in a U.S. retailer, but "seems like the most logical partner," he says—if not outright buyer.

05	10	15	20	25
30	35	40	45	50
55	60	65	70	75
80	85	90	95	100

Crowdfunding's Big Year

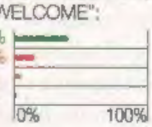
Odds of a LendingClub IPO in 2014

LendingClub will go public in a highly successful, drama-less event. Then will come the blowback. If loan default rates rise because of a stumble in the economy, then the sky-high returns that lenders are getting now may well tumble—from the current average 9% or so to about 5%. Traditional lending institutions are also likely to grumble about the competition, claiming that peer-to-peer funders are crippling the long-term viability of that classic American company-builder: the small-business loan. But somehow both the S&Ls and P2Ps survive the year, albeit with increased regulation for the latter.

BITCOIN

WILL STAY IRRELEVANT

THE HYPED-UP CRYPTO-CURRENCY AND DARLING OF THE TECHNO-LIBERTARIAN SET HAS A PROBLEM: IT'S FAIRLY DIFFICULT TO SPEND BITCOINS ON EVERYDAY TRANSACTIONS. FOR THE MOST PART, OWNERS HORDE THEIR STASH OR TRADE IT ON MT.GOX RATHER THAN USE IT TO PAY FOR, SAY, TOOTHPASTE. WILL 2014 BE THE YEAR THAT CHANGES? HONESTLY, NO. HERE, THE CHANCES A BUSINESS WILL ANNOUNCE "BITCOINS WELCOME":



2014 WILL BRING 3-D EVERYTHING

Decent 3-D printers drop to the sub-$1,000 mark, laptops get a third dimension of display, and Googlers add holography to their widely used in-house videoconferencing system—making faraway co-workers feel as if they're in the same room.

January 13, 2014 Volume 169 Number 1

WHILE YOU WERE OUT
BY STANLEY BING

THE WORLD'S FAIR OF 2064

What wonders will be on display half a century hence? Our cranial implants will be boggled!

FIFTY YEARS AGO the writer Isaac Asimov took a guess at what a World's Fair of 2014 might look like, on the occasion of the one held in New York in 1964. He got a lot right. He foresaw cordless appliances, for instance, and predicted that there would be robots but that they would not be very good. Today, as we consider the future, one thing stands clear: There is no World's Fair of 2014. This contentious world, while it has grown smaller and closer in some respects, is in no mood to hold a celebration for itself. If it did, you would probably see one pavilion trying to acquire and consolidate its competitors while another tried to blow up its neighbors.

Still, by 2064 it is possible that the world will be in shape to give itself one heck of a great fair. It would be very different, of course, from the one that took place 100 years earlier.

First of all, there would be no national exhibits, because there will be very little interest in nationalism as such. The U.S. will still exist, we may assume, but any attempt to unite the Red exhibit with the Blue exhibit and then incorporate it with the Green exhibit will fail, and the notion of having three discordant displays costing three times the price of one will be rejected by what remains of the federal government. The impoverished, violent oligarchy that was once Russia will have dropped out as well, along with Europe, which won't be able to afford the airfare.

Rushing in to fill the void, however, will be the three or four great global corporate states that serve and supply the world with all its needs.

The pavilion operated by Planet Amazon will be a splendid sight to see. By that time the merged super-entity will have acquired or put out of business all book suppliers, wine and liquor merchants, local food markets and supermarkets, drugstores, box stores, movie and television enterprises, newspapers and magazines, automobile companies—indeed, all the means by which people acquire the tools and supplies to feed, entertain, and transport themselves. The wonder of the fair, this exhibit will be staffed by state-of-the-art robots that are still quite flawed in many ways: Able to speak, walk, and appear somewhat human, they are as stupid as posts and truculent when frustrated.

Next door, the Temple of Facebook will be an inspiration to those who believe that our species is destined one day to be a unified meta-organism linked into a vast neural network with each of us as an individual node. Making this possible by that time will be the cortical-cranial implants that will have made obsolete all external means of digital communications—smartphones, tablets, glasses, even dinosaurs like wall-size television sets—all of which will have been internalized and powered by the electrical impulses that run what used to be our brains. Visitors to the exhibit will sample the full power of the collective mind maintained by the conglomerate that now includes Twitter, Microsoft, IBM, Apple, and finally, after a long struggle, Japan.

Time will not permit us to enjoy the wonders offered by frenetic, polluted China Inc., possibly because it will have torn down its pavilion as soon as it was finished and started building it all over again. Nor will we be able to report on the World Stadium provided by the corporations that run Brazil, because it will keep collapsing.

On our way out of the grounds, we will look up to see the circling swarm of drones. The Facebook drones will anticipate where each visitor will be and make sure everyone remains safe, secure, and engaged with all of his or her friends and relatives. Those of Planet Amazon will be busy supplying the fair with broiled turkey legs and cotton candy.

Given the advances to be made in the next few years on the issue of longevity, I fully expect to see all of you there. ■

Stanley Bing's new book, The Curriculum, *will be published by HarperCollins in April 2014.*

JASON SCHNEIDER

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The search for
Higgs boson.
What does it take to support such
immense data storage?
DATA STORAGE SYSTEM CHALLENGE
The Higgs boson is what holds the basic building blocks of our universe together. For years, scientists have been trying to isolate it with a Large Hadron Collider (LHC) that creates 600,000,000 collisions among 3,000,000,000,000,000 protons every second. In the same time, over 50,000,000,000,000 bytes of data are being analyzed to prove the particle's existence. With such massive and fast-growing data, is there a storage system that can meet the extraordinary demands of capacity, speed, and scalability?
A BETTER WAY
HUAWEI OceanStor STORAGE SYSTEM
Massive read-write ability and scalability for big data
Huawei continuously looks into storage innovations to develop the most advanced systems for our clients. And this time, the OceanStor System lived up to the highest of expectations, exhibiting excellent writing and reading performance, plus highly versatile horizontal scalability, in what could be the most ambitious scientific endeavor since the start of time.
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